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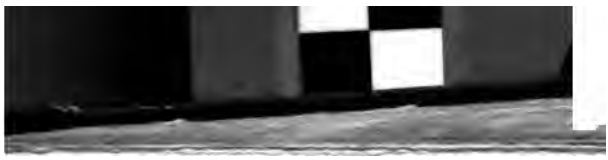

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THE MIND AND THE BRAIN

BY

ALFRED BINET

DIRECTEUR DU LABORATOIRE DE PSYCHOLOGIE
À LA SORBONNE

BEING THE AUTHORISED TRANSLATION OF

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CONTENTS

BOOK I

The Definition of Matter

CHAPTER I

Introduction

PAGE

The distinction between mind and matter—Knowable not homogeneous—Criterion employed, enumeration not concepts 3

CHAPTER II

Our Knowledge of External Objects only Sensation

Modern theories of matter—Outer world only known to us by our sensations—Instances—Mill's approval of proposition, and its defects—Nervous system only intermediary between self and outer world — The great *X* of Matter—Nervous system does not give us true image — Müller's law of specificity of the nerves—The nervous system itself a sensation—Relations of sensation with the unknowable the affair of metaphysics 10

31X685

CHAPTER III

The Mechanical Theories of Matter are only Symbols

PAGE

Physicists vainly endeavour to reduce the rôle of sensation —Mathematical, energetical, and mechanical theories of universe—Mechanical model formed from sensation —Instance of tuning-fork — No one sensation any right to hegemony over others 27

CHAPTER IV

Answers to some Objections, and Summary

Objections of spiritualists—Of German authors who contend that nervous system does give true image—Of metaphysicians—Common ground of objection that nervous system not intermediary—Answer to this—Summary of preceding chapters 44

BOOK II

The Definition of Mind

CHAPTER I

The Distinction between Cognition and its Object

Necessity for inventory of mental phenomena—Objects of cognition and acts of cognition—Definition of consciousness 55

CHAPTER II

Definition of Sensation

Sensation defined by experimental psychology—A state of consciousness—Considered self-evident by Mill, Renouvier, and Hume—Psycho-physical according to Reid and Hamilton—Reasons in favour of last definition—Other opinions examined and refuted . . 60

CHAPTER III

Definition of the Image

PAGE

Perception and ideation cannot be separated—Perception constituted by addition of image to sensation—Hallucinations—Objections anticipated and answered . . 76

CHAPTER IV

Definition of the Emotions

Contrary opinions as to nature of emotions—Emotion a phenomenon *sui generis*—Intellectualist theory of emotion supported by Lange and James—Is emotion only a perception? Is effort?—Question left unanswered 88

CHAPTER V

Definition of the Consciousness—The Relation Subject-Object

Can thoughts be divided into subject and object?—This division cannot apply to the consciousness—Subject of cognition itself an object—James' opinion examined—Opinion that subject is spiritual substance and consciousness its faculty refuted 96

CHAPTER VI

Definition of the Consciousness—Categories of the Understanding

Principle of relativity doubted—Tables of categories: Aristotle, Kant, and Renouvier—Kantian idealism—Phenomenism of Berkeley examined and rejected—Argument of *a priorists*—The intelligence only an inactive consciousness—Huxley's epiphenomenal consciousness—Is the consciousness necessary?—Impossibility of answering this question 103

CHAPTER VII

Definition of the Consciousness—The Separability of the Consciousness from its Object—Discussion of Idealism

PAGE

Can the consciousness be separated from its object?—Idealists consider the object a modality of the consciousness and thus inseparable from it—Futility of this doctrine—Object can exist without consciousness 119

CHAPTER VIII

Definition of the Consciousness—The Separation of the Consciousness from its object—The Unconscious

Can ideas exist without consciousness?—No consciousness without an object — Can the consciousness die?—Enfeeblement of consciousness how accounted for—Doubling of consciousness in hysterics—Relations of physiological phenomena to consciousness—Consciousness cannot become unconscious and yet exist 126

CHAPTER IX

Definitions of Psychology

Difficulty of defining psychology—Definition by substance—Psychology not the science of the soul—Definition by enumeration: its error—Definition by method contradicts idea of consciousness—Externospection and introspection sometimes confused—Definition by content—Facts cannot be divided into those of consciousness and of unconsciousness—Descartes' definition of psychology insufficient—"Within and without" simile unanalogous—Definition by point of view—Inconsistencies of Ebbinghaus' contention—W. James' teleological theory—Definition by the peculiar nature of mental laws only one possible: why? 135

BOOK III

The Union of the Soul and the Body

CHAPTER I

The Mind has an Incomplete Life

PAGE

Problem of union of mind and body stated—Axiom of heterogeneity must be rejected — Phenomena of consciousness incomplete—Aristotle's *relatum* and *correlatum* applied to the terms mind and matter . 179

CHAPTER II

Spiritualism and Idealism

Spiritualist view that death cuts link between soul and body—Explanation of link fatal to system—Consciousness cannot exercise functions without objects of cognition—Idealism a kaleidoscopic system—Four affirmations of idealism: their inconsistency — Advantages of historical method 191

CHAPTER III

Materialism and Parallelism

Materialism oldest doctrine of all: many patristic authors lean towards it—Modern form of, receives impulse from advance of physical science—Karl Vogt's comparison of secretions of brain with that of kidneys—All materialist doctrines opposed to principle of heterogeneity — Modern materialism would make object generate consciousness—Materialists cannot demonstrate how molecular vibrations can be transformed into objects — Parallelism avoids issue by declaring mind to be function of brain—Parallelists declare physical and psychical life to be two parallel currents—Bain's support of this—Objections to: most important that it postulates consciousness as a complete whole . . 201

CHAPTER IV

Modern Theories

PAGE

Berkeley's idealism revived by Bergson, though with different standpoint—Admirable nature of Bergson's exposition—Fallacy of, part assigned to sensory nerves—Conscious sensations must be subsequent to excitement of sensory nerves and dependent on their integrity 225

CHAPTER V

Conclusion

Author's own theory only a hypothesis—Important conditions for solution of problem—Manifestations of consciousness conditioned by brain, but this last unconscious—Consciousness perceives only external object—Specificity of nerves not absolute—Why repeated excitements of nerve tend to become unconscious—Formation of habit and "instinct"—Resemblance to and distinction of this from parallelism—Advantages of new theory 234

CHAPTER VI

Recapitulation

Description of matter—Definition of mind—Objections to, answered—Incomplete existence of mind—Other theories—Nervous system must add its own effect to that of its excitant 256

BOOK I

THE DEFINITION OF MATTER

THE MIND AND THE BRAIN[1]

CHAPTER I

INTRODUCTION

THIS book is a prolonged effort to establish a distinction between what is called mind and what is called matter. Nothing is more simple than to realise this distinction when you do not go deeply into it; nothing is more difficult when you analyse it a little. At first sight, it seems impossible to confuse things so far apart as a thought and a block of stone; but on reflection this great contrast vanishes, and other differences have to be sought which are less apparent and of which one has not hitherto dreamed.

First let us say how the question presents itself to us. The fact which we must take as

[1] *L'Ame et le Corps.*—Disagreeable as it is to alter an author's title, the words "Soul and Body" had to be abandoned because of their different connotation in English. The title "Mind and Body" was also preoccupied by Bain's work of that name in this series. The title chosen has M. Binet's approval.—ED.

a starting point, for it is independent of every kind of theory, is that there exists something which is "knowable." Not only science, but ordinary life and our everyday conversation, imply that there are things that we know. It is with regard to these things that we have to ask ourselves if some belong to what we call the mind and others to what we call matter.

Let us suppose, by way of hypothesis, the knowable to be entirely and absolutely homogeneous. In that case we should be obliged to set aside the question as one already decided. Where everything is homogeneous, there is no distinction to be drawn. But this hypothesis is, as we all know, falsified by observation. The whole body of the knowable is formed from an agglomeration of extremely varied elements, amongst which it is easy to distinguish a large number of divisions. Things may be classified according to their colour, their shape, their weight, the pleasure they give us, their quality of being alive or dead, and so on; one much given to classification would only be troubled by the number of possible distinctions.

Since so many divisions are possible, at which shall we stop and say: this is the one which corresponds exactly to the opposition of mind and matter? The choice is not easy to make;

for we shall see that certain authors put the distinction between the physical and the mental in one thing, others in another. Thus there have been a very large number of distinctions proposed, and their number is much greater than is generally thought. Since we propose to make ourselves judges of these distinctions, since, in fact, we shall reject most of them in order to suggest entirely new ones, it must be supposed that we shall do so by means of a criterion. Otherwise, we should only be acting fantastically. We should be saying peremptorily, "In my opinion this is mental," and there would be no more ground for discussion than if the assertion were "I prefer the Romanticists to the Classicists," or "I consider prose superior to poetry."

The criterion which I have employed, and which I did not analyse until the unconscious use I had made of it revealed its existence to me, is based on the two following rules:—

1. *A Rule of Method.*—The distinction between mind and matter must not only apply to the whole of the knowable, but must be the deepest which can divide the knowable, and must further be one of a permanent character. *A priori*, there is nothing to prove the existence of such a distinction; it must be sought for and, when found, closely examined.

2. *An Indication of the Direction in which the*

Search must be Made.—Taking into account the position already taken up by the majority of philosophers, the manifestation of mind, if it exists, must be looked for in the domain of facts dealt with by psychology, and the manifestation of matter in the domain explored by physicists.

I do not conceal from myself that there may be much that is arbitrary in my own criterion; but this does not seem to me possible to avoid. We must therefore appeal to psychology, and ask whether it is cognisant of any phenomenon offering a violent, lasting, and ineffaceable contrast with all the rest of the knowable.

The Method of Concepts and the Method of Enumeration. — Many authors are already engaged in this research, and employ a method which I consider very bad and very dangerous—the method of concepts. This consists in looking at real and concrete phenomena in their most abstract form. For example, in studying the mind, they use this word "mind" as a general idea which is supposed to contain all the characteristics of psychical phenomena; but they do not wait to enumerate these characteristics or to realise them, and they remain satisfied with the extremely vague idea springing from an unanalysed concept. Consequently they use the word "mind" with the imprudence of a banker who should discount a

trade bill without ascertaining whether the payment of that particular piece of paper had been provided for. This amounts to saying that the discussion of philosophical problems takes especially a verbal aspect; and the more complex the phenomena a concept thus handled contains, the more dangerous it is. A concept of the colour red has but a very simple content, and by using it, this content can be very clearly represented. But how can the immense meaning of the word "mind" be realised every time that it is used? For example, to define mind and to separate it from the rest of the knowable which is called matter, the general mode of reasoning is as follows: all the knowable which is apparent to our senses is essentially reduced to motion; "mind," that something which lives, feels, and judges, is reduced to "thought." To understand the difference between matter and mind, it is necessary to ask one's self whether there exists any analogy in nature between motion and thought. Now this analogy does not exist, and what we comprehend, on the contrary, is their absolute opposition. Thought is not a movement, and has nothing in common with a movement. A movement is never anything else but a displacement, a transfer, a change of place undergone by a particle of matter. What relation of similarity exists between this geometrical fact and a desire, an emotion, a sensation of bitterness? Far from

being identical, these two facts are as distinct as any facts can be, and their distinction is so deep that it should be raised to the height of a principle, the principle of heterogeneity.

This is almost exactly the reasoning that numbers of philosophers have repeated for several years without giving proof of much originality. This is what I term the metaphysics of concept, for it is a speculation which consists in juggling with abstract ideas. The moment that a philosopher opposes thought to movement, I ask myself under what form he can think of a "thought." I suppose he must very poetically and very vaguely represent to himself something light and subtle which contrasts with the weight and grossness of material bodies. And thus our philosopher is punished in the sinning part; his contempt of the earthly has led him into an abuse of abstract reasoning, and this abuse has made him the dupe of a very naïve physical metaphor.

At bottom I have not much faith in the nobility of many of our abstract ideas. In a former psychological study[1] I have shown that many of our abstractions are nothing else than embryonic, and, above all, loosely defined concrete ideas, which can satisfy only an indolent mind, and are, consequently, full of snares.

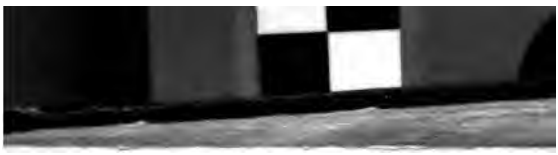
[1] *Étude experimentale de l'Intelligence.* Paris: Schleicher.

The opposition between mind and matter appears to me to assume a very different meaning if, instead of repeating ready-made formulas and wasting time on the game of setting concept against concept, we take the trouble to return to the study of nature, and begin by drawing up an inventory of the respective phenomena of mind and matter, examining with each of these phenomena the characteristics in which the first-named differ from the second. It is this last method, more slow but more sure than the other, that we shall follow ; and we will commence by the study of matter.

CHAPTER II

OUR KNOWLEDGE OF EXTERNAL OBJECTS IS ONLY SENSATIONS

Of late years numerous studies have been published on the conception of matter, especially by physicists, chemists, and mathematicians. Among these recent contributions to science I will quote the articles of Duhem on the Evolution of Mechanics published in 1903 in the *Revue générale des Sciences*, and other articles by the same author, in 1904, in the *Revue de Philosophie*. Duhem's views have attracted much attention, and have dealt a serious blow at the whole theory of the mechanics of matter. Let me also quote that excellent work of Dastre, *La Vie et la Mort*, wherein the author makes so interesting an application to biology of the new theories on energetics; the discussion between Ostwald and Brillouin on matter, in which two rival conceptions find themselves engaged in a veritable hand-to-hand struggle (*Revue générale des Sciences*, Nov. and Dec. 1895); the curious work of Dantec on *les Lois Naturelles*, in which the author ingeniously points out the different



sensorial districts into which science is divided, although, through a defect in logic, he accepts mechanics as the final explanation of things. And last, it is impossible to pass over, in silence, the rare works of Lord Kelvin, so full, for French readers, of unexpected suggestions, for they show us the entirely practical and empirical value which the English attach to mechanical models.

My object is not to go through these great studies in detail. It is the part of mathematical and physical philosophers to develop their ideas on the inmost nature of matter, while seeking to establish theories capable of giving a satisfactory explanation of physical phenomena. This is the point of view they take up by preference, and no doubt they are right in so doing. The proper rôle of the natural sciences is to look at phenomena taken by themselves and apart from the observer.

My own intention, in setting forth these same theories on matter, is to give prominence to a totally different point of view. Instead of considering physical phenomena in themselves, we shall seek to know what idea one ought to form of their nature when one takes into account that they are observed phenomena. While the physicist withdraws from consideration the part of the observer in the verification of physical phenomena, our rôle is to renounce this abstrac-

tion, to re-establish things in their original complexity, and to ascertain in what the conception of matter consists when it is borne in mind that all material phenomena are known only in their relation to ourselves, to our bodies, our nerves, and our intelligence.

This at once leads us to follow, in the exposition of the facts, an order which the physicist abandons. Since we seek to know what is the physical phenomenon we perceive, we must first enunciate this proposition, which will govern the whole of our discussion: to wit—

Of the outer world we know nothing except our sensations.

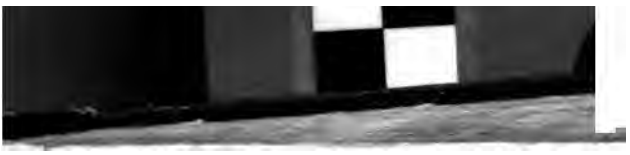
Before demonstrating this proposition, let us develop it by an example which will at least give us some idea of its import. Let us take as example one of those investigations in which, with the least possible recourse to reasoning, the most perfected processes of observation are employed, and in which one imagines that one is penetrating almost into the very heart of nature. We are, let us suppose, dissecting an animal. After killing it, we lay bare its viscera, examine their colour, form, dimensions, and connections; then we dissect the organs in order to ascertain their internal nature, their texture, structure, and function; then, not content with ocular anatomy, we have recourse to the perfected pro-

cesses of histology: we take a fragment of the tissues weighing a few milligrammes, we fix it, we mount it, we make it into strips of no more than a thousandth of a millimetre thick, we colour it and place it under the microscope, we examine it with the most powerful lenses, we sketch it, and we explain it. All this work of complicated and refined observation, sometimes lasting months and years, results in a monograph containing minute descriptions of organs, of cells, and of intra-cellular structures, the whole represented and defined in words and pictures. Now, these descriptions and drawings are the display of the various sensations which the zoologist has experienced in the course of his labours; to these sensations are added the very numerous interpretations derived from the memory, reasoning, and often, also, from the imagination on the part of the scholar, the last a source at once of errors and of discoveries. But everything properly experimental in the work of the zoologist proceeds from the sensations he has felt or might have felt, and in the particular case treated of, these sensations are almost solely visual.

This observation might be repeated with regard to all objects of the outer world which enter into relation with us. Whether the knowledge of them be of the commonplace or of a scientific order matters little. Sensation is its limit, and

all objects are known to us by the sensations they produce in us, and are known to us solely in this manner. A landscape is nothing but a cluster of sensations. The outward form of a body is simply sensation; and the innermost and most delicate material structure, the last visible elements of a cell, for example, are all, in so far as we observe them with the microscope, nothing but sensation.

This being understood, the question is, why we have just admitted—with the majority of authors—that we cannot really know a single object as it is in itself, and in its own nature, otherwise than by the intermediary of the sensations it provokes in us? This comes back to saying that we here require explanations on the two following points: why do we admit that we do not really perceive the objects, but only something intermediate between them and us; and why do we call this something intermediate a sensation? On this second point I will offer, for the time being, one simple remark: we use the term sensation for lack of any other to express the intermediate character of our perception of objects, and this use does not, on our part, imply any hypothesis. Especially do we leave completely in suspense the question whether sensation is a material phenomenon or a state of being of the mind. These are questions we will deal with later. For the present it must be



understood that the word sensation is simply a term for the something intermediate between the object and our faculty of cognition.[1] We have, therefore, simply to state why we have admitted that the external perception of objects is produced mediately or by procuration.

There are a few philosophers, and those not of the lowest rank, who have thought that this intermediate character of all perception was so evident that there was no need to insist further upon it. John Stuart Mill, who was certainly and perhaps more than anything a careful logician, commences an exposition of the idealist thesis to which he was so much attached, by carelessly saying: "It goes without saying that objects are known to us through the intermediary of our senses. . . . The senses are equivalent to our sensations;"[2] and on those propositions he rears his whole system. "It goes without saying . . ." is a trifle thoughtless. I certainly think he was wrong in not testing more carefully the solidity of his starting point.

In the first place, this limit set to our knowledge of the objects which stimulate our sensations is only accepted without difficulty by well-informed

[1] *Connaissance.*—The word cognition is used throughout as the English equivalent of this, except in places where the context shows that it means acquaintance merely.—ED.

[2] J. S. MILL, *An Examination of Sir Wm. Hamilton's Philosophy*, pp. 5 and 6. London. 1865.

persons; it much astonishes the uninstructed when first explained to them. And this astonishment, although it may seem so, is not a point that can be neglected, for it proves that, in the first and simple state of our knowledge, we believe we directly perceive objects as they are. Now, if we, the cultured class, have, for the most part,[1] abandoned this primitive belief, we have only done so on certain implicit conditions, of which we must take cognisance. This is what I shall now demonstrate as clearly as I can.

Take the case of an unlearned person. To prove to him that he knows sensations alone and not the bodies which excite them, a very striking argument may be employed which requires no subtle reasoning and which appeals to his observation. This is to inform him, supposing he is not aware of the fact, that, every time he has the perception of an exterior object, there is something interposed between the object and himself, and that that something is his nervous system.

If we were not acquainted with the existence of our nervous system, we should unhesitatingly admit that our perception of objects consisted in some sort of motion towards the places in which they were fixed. Now, a number of experiments prove to us that objects are known to us as excitants of

[1] A few subtle philosophers have returned to it, as I shall how later in chapter iv.

our nervous system which only act on this system by entering into communication, or coming into contact with, its terminal extremities. They then produce, in the interior of this system, a peculiar modification which we are not yet able to define. It is this modification which follows the course of the nerves and is carried to the central parts of the system. The speed of the propagation of this nerve modification has been measured by certain precise experiments in psychometry; the journey is made slowly, at the rate of 20 to 30 metres per second, and it is of interest that this rate of speed lets us know at what moment and, consequently, by what organic excitement, the phenomenon of consciousness is produced. This happens when the cerebral centres are affected; the phenomenon of consciousness is therefore posterior to the fact of the physical excitement.

I believe it has required a long series of accepted observations for us to have arrived at this idea, now so natural in appearance, that the modifications produced within our nervous system are the only states of which we can have a direct consciousness; and as experimental demonstration is always limited, there can be no absolute certainty that things never happen otherwise, that we never go outside ourselves, and that neither our consciousness nor our nervous influx can exteriorise itself, shoot beyond our material

organs, and travel afar in pursuit of objects in order to know or to modify them.

Before going further, we must make our terminology more precise. We have just seen the necessity of drawing a distinction between the sensations of which we are conscious and the unknown cause which produces these sensations by acting on our nervous systems. This exciting cause I have several times termed, in order to be understood, the external object. But under the name of external object are currently designated groups of sensations, such as those which make up for us a chair, a tree, an animal, or any kind of body. I see a dog pass in the street. I call this dog an external object; but, as this dog is formed, for me who am looking at it, of my sensations, and as these sensations are states of my nervous centres, it happens that the term external object has two meanings. Sometimes it designates our sensations; at another, the exciting cause of our sensations. To avoid all confusion we will call this exciting cause, which is unknown to us, the *X* of matter.

It is, however, not entirely unknown, for we at least know two facts with regard to it. We know, first, that this *X* exists, and in the second place, that its image must not be sought in the sensations it excites in us. How can we doubt, we say,

that it exists? The same external observation proves to us at once that there exists an object distinct from our nerves, and that our nerves separate us from it. I insist on this point, for the reason that some authors, after having unreservedly admitted that our knowledge is confined to sensations, have subsequently been hard put to it to demonstrate the reality of the excitant distinct from the sensations.[1] Of this we need no demonstration, and the testimony of our senses suffices. We have seen the excitant, and it is like a friend who should pass before us in disguise so well costumed and made up that we can attribute to his real self nothing of what we see of him, but yet we know that it is he.

And, in fact, let us remember what it is that we have argued upon—viz. on an observation. I look at my hand, and I see an object approaching it which gives me a sensation of feeling. I at first say that this object is an excitant. It is pointed out to me that I am in error. This object, which appears to me outside my nervous system, is composed, I am told, of sensations. Be it so, I have the right to answer; but if all that

[1] Thus, the perplexity in which John Stuart Mill finds himself is very curious. Having admitted unreservedly that our knowledge is confined to sensations, he is powerless to set up a reality outside this, and acknowledges that the principle of causality cannot legitimately be used to prove that our sensations have a cause which is not a sensation, because this principle cannot be applied outside the world of phenomena.

I perceive is sensation, my nervous system itself is a sensation; if it is only that, it is no longer an intermediary between the excitant and myself, and it is the fact that we perceive things as they are. For it to be possible to prove that I perceive, not the object, but that *tertium quid* which is sensation, it has to be admitted that the nervous system is a reality external to sensation and that objects which assume, in relation to it, the rôle of excitants and of which we perceive the existence, are likewise realities external to sensation.

This is what is demonstrated by abstract reasoning, and this reasoning is further supported by a common-sense argument. The outer world cannot be summarised in a few nervous systems suspended like spiders in empty space. The existence of a nervous system implies that of a body in which it is lodged. This body must have complicated organs; its limbs presuppose the soil on which the animal rests, its lungs the existence of oxygen vivifying its blood, its digestive tube, aliments which it digests and assimilates to its substance, and so on. We may indeed admit that this outer world is not, in itself, exactly as we perceive it; but we are compelled to recognise that it exists by the same right as the nervous system, in order to put it in its proper place.

The second fact of observation is that the

sensations we feel do not give us the true image of the material *X* which produces them. The modification made in our substance by this force *X* does not necessarily resemble in its nature the nature of that force. This is an assertion opposed to our natural opinions, and must consequently be demonstrated. It is generally proved by the experiments which reveal what is called "the law of the specific energy of the nerves." This is an important law in physiology discovered by Müller two centuries ago, and consequences of a philosophical order are attached to it. The facts on which this law is based are these. It is observed that, if the sensory nerves are agitated by an excitant which remains constant, the sensations received by the patient differ according to the nerve affected. Thus, the terminals of an electric current applied to the ball of the eye give the sensation of a small luminous spark; to the auditory apparatus, the current causes a crackling sound; to the hand, the sensation of a shock; to the tongue, a metallic flavour. Conversely, excitants wholly different, but affecting the same nerve, give similar sensations; whether a ray of light is projected into the eye, or the eyeball be excited by the pressure of a finger; whether an electric current is directed into the eye, or, by a surgical operation, the optic nerve is severed by a bistoury, the effect is always the

same, in the sense that the patient always receives a sensation of light. To sum up, in addition to the natural excitant of our sensory nerves, there are two which can produce the same sensory effects, that is to say, the mechanical and the electrical excitants. Whence it has been concluded that the peculiar nature of the sensation felt depends much less on the nature of the excitant producing it than on that of the sensory organ which collects it, the nerve which propagates it, or the centre which receives it. It would perhaps be going a little too far to affirm that the external object has no kind of resemblance to the sensations it gives us. It is safer to say that we are ignorant of the degree in which the two resemble or differ from each other.

On thinking it over, it will be found that this contains a very great mystery, for this power of distinction (*specificité*) of our nerves is not connected with any detail observable in their structure. It is very probably the receiving centres which are specific. It is owing to them and to their mechanism that we ought to feel, from the same excitant, a sensation of sound or one of colour, that is to say, impressions which appear, when compared, as the most different in the world. Now, so far as we can make out, the histological structure of our auditory centre is the same as that of our visual centre. Both are a collection of cells

diverse in form, multipolar, and maintained by a conjunctive pellicule (*stroma*). The structure of the fibres and cells varies slightly in the motor and sensory regions, but no means have yet been discovered of perceiving a settled difference between the nerve-cells of the optic centre and those of the auditory centre. There should be a difference, as our mind demands it; but our eye fails to note it.

Let us suppose, however, that to-morrow, or several centuries hence, an improved *technique* should show us a material difference between the visual and the auditory neurone. There is no absurdity in this supposition; it is a possible discovery, since it is of the order of material facts. Such a discovery, however, would lead us very far, for what terribly complicates this problem is that we cannot directly know the structure of our nervous system. Though close to us, though, so to speak, inside us, it is not known to us otherwise than is the object we hold in our hands, the ground we tread, or the landscape which forms our horizon.

For us it is but a sensation, a real sensation when we observe it in the dissection of an animal, or the autopsy of one of our own kind; an imaginary and transposed sensation, when we are studying anatomy by means of an anatomical chart; but still a sensation. It is by the inter-

mediary of our nervous system that we have to perceive and imagine what a nervous system is like; consequently we are ignorant as to the modification impressed on our perceptions and imaginations by this intermediary, the nature of which we are unable to grasp.

Therefore, when we attempt to understand the inmost nature of the outer world, we stand before it as before absolute darkness. There probably exists in nature, outside of ourselves, neither colour, odour, force, resistance, space, nor anything that we know as sensation. Light is produced by the excitement of the optic nerve, and it shines only in our brain; as to the excitement itself, there is nothing to prove that it is luminous; outside of us is profound darkness, or even worse, since darkness is the correlation of light. In the same way, all the sonorous excitements which assail us, the creakings of machines, the sounds of nature, the words and cries of our fellows are produced by excitements of our acoustic nerve; it is in our brain that noise is produced, outside there reigns a dead silence. The same may be said of all our other senses.

Not one of our senses, absolutely none, is the revealer of external reality. From this point of view there is no higher and no lower sense. The sensations of sight, apparently so objective and so searching, no more take us out of our-

selves than do the sensations of taste which are localised in the tongue.

In short, our nervous system, which enables us to communicate with objects, prevents us, on the other hand, from knowing their nature. It is an organ of relation with the outer world; it is also, for us, a cause of isolation. We never go outside ourselves. We are walled in. And all we can say of matter and of the outer world is, that it is revealed to us solely by the sensations it affords us, that it is the unknown cause of our sensations, the inaccessible excitant of our organs of the senses, and that the ideas we are able to form as to the nature and the properties of that excitant, are necessarily derived from our sensations, and are subjective to the same degree as those sensations themselves.

But we must make haste to add that this point of view is the one which is reached when we regard the relations of sensation with its unknown cause the great *X* of matter.[1] Positive science and practical life do not take for an objective this relation of sensation with the Unknowable; they leave this to metaphysics. They distribute themselves over the study of sensation and examine the reciprocal relations of sensations with sensations. These last, condemned as misleading appearances when we seek

[1] See p. 18, *sup.*—ED.

in them the expression of the Unknowable, lose this illusory character when we consider them in their reciprocal relations. Then they constitute for us reality, the whole of reality and the only object of human knowledge. The world is but an assembly of present, past, and possible sensations; the affair of science is to analyse and co-ordinate them by separating their accidental from their constant relations.

CHAPTER III

THE MECHANICAL THEORIES OF MATTER ARE ONLY SYMBOLS

If we keep firmly in mind the preceding conclusion — a conclusion which is neither exclusively my own, nor very new—we shall find a certain satisfaction in watching the discussions of physicists on the essence of matter, on the nature of force and of energy, and on the relations of ponderable and unponderable matter. We all know how hot is the fight raging on this question. At the present time it is increasing in intensity, in consequence of the disturbance imported into existing theories by the new discoveries of radio-activity.[1] We psychologists can look on very calmly at these discussions, with that selfish pleasure we unavowedly feel when we see people fighting while ourselves safe from knocks. We have, in fact, the feeling that, come what may from the discussions on the essence of matter, there can be no going

[1] I would draw attention to a recent volume by GUSTAVE LE BON, on *l'Evolution de la Matière*, a work full of original and bold ideas.

beyond the truth that matter is an excitant of our nervous system, and is only known in connection with the perception we have of this last.

If we open a work on physics or physiology we shall note with astonishment how the above considerations are misunderstood. Observers of nature who seek, and rightly, to give the maximum of exactness to their observations, show that they are obsessed by one constant prejudice: they mistrust sensation.

A great part of their efforts consists, by what they say, in reducing the rôle of sensation to its fitting part in science; and the invention of mechanical aids to observation is constantly held up as a means of remedying the inperfection of our senses. In physics the thermometer replaces the sensation of heat that our skin—our hand, for example—experiences by the measurable elevation of a column of mercury, and the scale-pan of a precise balance takes the place of the vague sensation of trifling weights; in physiology a registering apparatus replaces the sensation of the pulse which the doctor feels with the end of his forefinger by a line on paper traced with indelible ink, of which the duration and the intensity, as well as the varied combinations of these two elements, can be measured line by line.

Learned men who pride themselves on their

philosophical attainments vaunt in very eloquent words the superiority of the physical instrument over mere sensation. Evidently, however, the earnestness of this eulogy leads them astray. The most perfect registering apparatus must, in the long-run, after its most scientific operations, address itself to our senses and produce in us some small sensation. The reading of the height reached by the column of mercury in a thermometer when heated is accomplished by a visual sensation, and it is by the sight that the movements of the balance are controlled, and that the traces of the sphygmograph are analysed. We may readily admit to physicists and physiologists all the advantages of these apparatus. This is not the question. It simply proves that there are sensations and sensations, and that certain of these are better and more precise than others. The visual sensation of relation in space seems to be *par excellence* the scientific sensation which it is sought to substitute for all the rest. But, after all, it is but a sensation.

Let us recognise that there is, in all this contempt on the part of physicists for sensation, only differences in language, and that a paraphrase would suffice to correct them without leaving any trace. Be it so. But something graver remains. When one is convinced that our knowledge of the outer world is limited to

sensations, we can no longer understand how it is possible to give oneself up, as physicists do, to speculations upon the constitution of matter.

Up to the present there have been three principal ways of explaining the physical phenomena of the universe. The first, the most abstract, and the furthest from reality, is above all verbal. It consists in the use of formulas in which the quality of the phenomena is replaced by their magnitude, in which this magnitude, ascertained by the most precise processes of measurement, becomes the object of abstract reasoning which allows its modifications to be foreseen under given experimental conditions. This is pure mathematics, a formal science depending upon logic. Another conception, less restricted than the above, and of fairly recent date, consists in treating all manifestations of nature as forms of energy. This term "energy" has a very vague content. At the most it expresses but two things: first, it is based on a faint recollection of muscular force, and it reminds one dimly of the sensation experienced when clenching the fists; and, secondly, it betrays a kind of very natural respect for the forces of nature which, in all the images man has made of them, constantly appear superior to his own. We may say "the energy of nature;" but we should never say, what would be experimentally correct, "the weakness

of nature." The word "weakness" we reserve for ourselves. Apart from these undecided suggestions, the term energy is quite the proper term to designate phenomena, the intimate nature of which we do not seek to penetrate, but of which we only wish to ascertain the laws and measure the degrees.

A third conception, more imaginative and bolder than the others, is the mechanical or kinetic theory. This last absolutely desires that we should represent to ourselves, that we should imagine, how phenomena really take place; and in seeking for the property of nature the most clearly perceived, the easiest to define and analyse, and the most apt to lend itself to measurement and calculation, it has chosen motion. Consequently all the properties of matter have been reduced to this one, and in spite of the apparent contradiction of our senses, it has been supposed that the most varied phenomena are produced, in the last resort, by the displacement of material particles. Thus, sound, light, heat, electricity, and even the nervous influx would be due to vibratory movements, varying only by their direction and their periods, and all nature is thus explained as a problem of animated geometry. This last theory, which has proved very fertile in explanations of the most delicate phenomena of sound and light, has so strongly impressed many minds that it

has led them to declare that the explanation of phenomena by the laws of mechanics alone has the character of a scientific explanation. Even recently, it seemed heresy to combat these ideas.

Still more recently, however, a revulsion of opinion has taken place. Against the physicists, the mathematicians in particular have risen up, and taking their stand on science, have demonstrated that all the mechanisms invented have crowds of defects. First, in each particular case, there is such a complication that that which is defined is much more simple than the definition; then there is such a want of unity that quite special mechanisms adapted to each phenomenal detail have to be imagined; and, lastly—most serious argument of all—so much comprehensiveness and suppleness is employed, that no experimental law is found which cannot be understood mechanically, and no fact of observation which shows an error in the mechanical explanation—a sure proof that this mode of explanation has no meaning.

My way of combating the mechanical theory starts from a totally different point of view. Psychology has every right to say a few words here, as upon the value of every kind of scientific theory; for it is acquainted with the nature of the mental needs of which these theories are the expression and which these theories seek to satisfy.

It has not yet been sufficiently noticed that psychology does not allow itself to be confined, like physics or sociology, within the logical table of human knowledge, for it has, by a unique privilege, a right of supervision over the other sciences. We shall see that the psychological discussion of mechanics has a wider range than that of the mathematicians.

Since our cognition cannot go beyond sensation, shall we first recall what meaning can be given to an explanation of the inmost nature of matter? It can only be an artifice, a symbol, or a process convenient for classification in order to combine the very different qualities of things in one unifying synthesis—a process having nearly the same theoretical value as a *memoria technica*, which, by substituting letters for figures, helps us to retain the latter in our minds. This does not mean that figures are, in fact, letters, but it is a conventional substitution which has a practical advantage. What *memoria technica* is to the ordinary memory, the theory of mechanics should be for our needed unification.

Unfortunately, this is not so. The excuse we are trying to make for the mechanicians is illusory. There is no mistaking their ambition. Notwithstanding the prudence of some and the equivocations in which others have rejoiced, they have drawn their definition in the absolute and not in

the relative. To take their conceptions literally, they have thought the movement of matter to be something existing outside our eye, our hands, and our sense; in a word, something *noumenal*, as Kant would have said. The proof that this is their real idea, is that movement is presented to us as the true outer and explanatory cause of our sensations, the external excitement to our nerves. The most elementary works on physics are impregnated with this disconcerting conception. If we open a description of acoustics, we read that sound and noise are subjective states which have no reality outside our auditory apparatus; that they are sensations produced by an external cause, which is the vibratory movement of sonorous bodies — whence the conclusion that this vibratory movement is not itself a sensation. Or, shall we take another proof, still more convincing. This is the vibratory and silent movement which is invoked by physicists to explain the peculiarities of subjective sensation; so that the interferences, the pulsations of sound, and, in fine, the whole physiology of the ear, is treated as a problem in kinematics, and is explained by the composition of movements.

What kind of reality do physicists then allow to the displacements of matter? Where do they place them, since they recognise otherwise that the essence of matter is unknown to us? Are we

to suppose that, outside the world of *noumena*, outside the world of phenomena and sensations, there exists a third world, an intermediary between the two former, the world of atoms and that of mechanics?

A short examination will, moreover, suffice to show of what this mechanical model is formed which is presented to us as constituting the essence of matter. This can be nothing else than the sensations, since we are incapable of perceiving or imagining anything else. It is the sensations of sight, of touch, and even of the muscular sense. Motion is a fact seen by the eye, felt by the hand; it enters into us by the perception we have of the solid masses visible to the naked eye which exist in our field of observation, of their movements and their equilibrium and the displacement we ourselves effect with our bodies. Here is the sensory origin, very humble and very gross, of all the mechanics of the atoms. Here is the stuff of which our lofty conception is formed. Our mind can, it is true, by a work of purification, strip movement of most of its concrete qualities, separate it even from the perception of the object in motion, and make of it a something or other ideal and diagrammatic; but there will still remain a residuum of visual, tactile, and muscular sensations, and consequently it is still nothing else than a subjective state, bound to the structure of

our organs. We are, for the rest, so wrapped up in sensations that none of our boldest conceptions can break through the circle.

But it is not the notion of movement alone which proceeds from sensation. There is also that of exteriority, of space, of position, and, by opposition, that of external or psychological events. Without declaring it to be certain, I will remind you that it is infinitely probable that these notions are derived from our muscular experience. Free motion, arrested motion, the effort, the speed, and the direction of motion, such are the sensorial elements, which, in all probability, constitute the foundation of our ideas on space and its properties. And these are so many subjective notions which we have no right to treat as objects belonging to the outer world.

What is more remarkable, also, is that even the ideas of object, of body, and of matter, are derived from visual and tactile sensations which have been illegitimately set up as entities. We have come, in fact, to consider matter as a being separate from sensations, superior to our sensations, distinct from the properties which enable us to know it, and binding together these properties, as it were, in a sheaf. Here again is a conception at the base of visualisation and muscularisation; it consists in referring to the visual and other sensations, raised for the occasion to the dignity of external and per-

manent causes, the other sensations which are considered as the effects of the first named upon our organs of sense.

It demands a great effort to clear our minds of these familiar conceptions which, it is plain, are nothing but naïve realism. Yes! the mechanical conception of the universe is nothing but naïve realism.

To recapitulate our idea, and, to make it more plain by an illustration, here is a tuning-fork on the table before me. With a vigorous stroke of the bow I set it vibrating. The two prongs separate, oscillate rapidly, and a sound of a certain tone is heard. I connect this tuning-fork, by means of electric wires, with a Déprez recording apparatus which records the vibrations on the blackened surface of a revolving cylinder, and we can thus, by an examination of the trace made under our eyes, ascertain all the details of the movement which animates it. We see, parallel to each other, two different orders of phenomena; the visual phenomena which show us that the tuning-fork is vibrating, and the auditory phenomena which convey to us the fact that it is making a sound.

The physicist, asked for an explanation of all this, will answer: "It is the vibration of the tuning-fork which, transmitted by the air, is carried to our auditory apparatus, causes a vibra-

tion in the tympanum, the movements of which are communicated to the small bones of the middle ear, thence (abridging details) to the terminations of the auditory nerve, and so produces in us the subjective sensation of sound." Well, in so saying, the physicist commits an error of interpretation; outside our ears there exists something we do not know which excites them; this something cannot be the vibratory movement of the tuning-fork, for this vibratory movement which we can see is likewise a subjective sensation; it no more exists outside our sight than sound exists outside our ears. In any case, it is as absurd to explain a sensation of sound by one of sight, as a sensation of sight by one of sound.

One would be neither further nor nearer to the truth if we answered that physicist as follows: "You give the preponderance to your eye; I myself give it to my ear. This tuning-fork appears to you to vibrate. Wrong! This is how the thing occurs. This tuning-fork produces a sound which, by exciting our retina, gives us a sense of movement. This visual sensation of vibration is a purely subjective one, the external cause of the phenomenon is the sound. The outer world is a concert of sounds which rises in the immensity of space. Matter is noise and nothingness is silence."

This theory of the above experiment is not

absurd; but, as a matter of fact, it is probable that no one would or could accept it, except verbally for amusement, as a challenge, or for the pleasure of talking metaphysics. The reason is that all our evolution, for causes which would take too long to detail, has established the hegemony of certain of our senses over the others. We have, above all, become visual and manual beings. It is the eye and the hand which give us the perceptions of the outer world of which we almost exclusively make use in our sciences; and we are now almost incapable of representing to ourselves the foundation of phenomena otherwise than by means of these organs. Thus all the preceding experiment from the stroke of the bow to the final noise presents itself to us in visual terms, and further, these terms are not confined to a series of detached sensations.

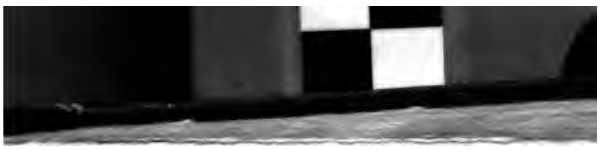
Visual sensation combines with the tactile and muscular sensations, and forms sensorial constructions which succeed each other, continue, and arrange themselves logically: in lieu of sensations, there are objects and relations of space between these objects, and the actions which connect them, and the phenomena which pass from one to the other. All that is only sensation, if you will; but merely as the agglutinated molecules of cement and of stone are a palace.

Thus the whole series of visual events which

compose our experiment with the tuning-fork can be coherently explained. One understands that it is the movement of my hand equipped with the bow which is communicated to the tuning-fork. One understands that this movement passing into the fork has changed its form and rhythm, that the waves produced by the fork transmit themselves, by the oscillations of the air-molecules, to our tympanum, and so on. There is in all this series of experiments an admirable continuity which fully satisfies our minds. However much we might be convinced by the theoretical reasons given above, that we have quite as much right to represent the same series of events in an auditory form, we should be incapable of realising that form to ourselves.

What would be the structure of the ear to any one who only knew it through the sense of hearing? What would become of the tympanum, the small bones, the cochlea, and the terminations of the acoustic nerve, if it were only permitted to represent them in the language of sound? It is very difficult to imagine.

Since, however, we are theorising, let us not be stopped by a few difficulties of comprehension. Perhaps a little training might enable us to overcome them. Perhaps musicians, who discern as much reality in what one hears as in what one sees, would be more apt than other folk to under-



stand the necessary transposition. Some of them, in their autobiographies, have made, by the way, very suggestive remarks on the importance they attribute to sound; and, moreover, the musical world, with its notes, its intervals, and its orchestration, lives and develops in a manner totally independent of vibration.

Perhaps we can here quote one or two examples which may give us a lead. To measure the length of a body instead of applying to it a yard-wand, one might listen to its sound; for the pitch of the sound given by two cords allows us to deduce their difference of length, and even the absolute length of each. The chemical composition of a body might be noted by its electric resistance and the latter verified by the telephone; that is to say, by the ear. Or, to take a more subtle example. We might make calculations with sounds of which we have studied the harmonic relations as we do nowadays with figures. A sum in rule of three might even be solved sonorously; for, given three sounds, the ear can find a fourth which should have the same relation to the third as the second to the first. Every musical ear performs this operation easily; now, this fourth sound, what else is it but the fourth term in a rule of three? And by taking into consideration the number of its vibrations a numerical solution would be found to the problem. This

novel form of calculating machine might serve to fix the price of woollen stuffs, to calculate brokerages and percentages, and the solution would be obtained without the aid of figures, without calculation, without visualisation, and by the ear alone.

By following up this idea, also, we might go a little further. We might arrive at the conviction that our present science is human, petty, and contingent; that it is closely linked with the structure of our sensory organs; that this structure results from the evolution which fashioned these organs; that this evolution has been an accident of history; that in the future it may be different; and that, consequently, by the side or in the stead of our modern science, the work of our eyes and hands—and also of our words—there might have been constituted, there may still be constituted, sciences entirely and extraordinarily new—auditory, olfactory, and gustatory sciences, and even others derived from other kinds of sensations which we can neither foresee nor conceive because they are not, for the moment, differentiated in us. Outside the matter we know, a very special matter fashioned of vision and touch, there may exist other matter with totally different properties.

But let us bring our dream to an end. The interest of our discussion does not lie in the

hypothetical substitution of hearing or any other sense for sight. It lies in the complete suppression of all explanation of the noumenal object in terms borrowed from the language of sensation. And that is our last word. We must, by setting aside the mechanical theory, free ourselves from a too narrow conception of the constitution of matter. And this liberation will be to us a great advantage which we shall soon reap. We shall avoid the error of believing that mechanics is the only real thing and that all that cannot be explained by mechanics must be incomprehensible. We shall then gain more liberty of mind for understanding what the union of the soul with the body[1] may be.

[1] See note on p. 3.—ED.

CHAPTER IV

ANSWERS TO SOME OBJECTIONS, AND SUMMARY

I HAVE set forth the foregoing ideas by taking the road which to me seemed the best. On reflection it has occurred to me that my manner of exposition and demonstration may be criticised much more than my conclusion. Now, as it is the conclusion alone which here is of importance, it is expedient not to make it responsible for the arguments by which I have supported it.

These arguments resolve themselves into the attestation that between objects and our consciousness there exists an intermediary, our nervous system. We have even established that the existence of this intermediary is directly proved by observation, and from this I have concluded that we do not directly perceive the object itself but a *tertium quid*, which is our sensations.

Several objections to this might be made. Let us enumerate them.

1. It is not inconceivable that objects may act directly on our consciousness without taking the intermediary of our nervous system. Some authors,

the spiritualists notably, believe in the possibility of disembodied souls, and they admit by implication that these souls remain in communication with the terrestrial world, witness our actions, and hear our speech. Since they no longer have organs of sense, we must suppose that these wandering souls, if they exist, can directly perceive material objects. It is evident that such hypotheses have, up till now, nothing scientific in them, and that the demonstrations of them which are given raise a feeling of scepticism more than anything else. Nevertheless, we have not the right to exclude, by *a priori* argument, the possibility of this category of phenomena.

2. Several German authors have maintained in recent years, that if the nervous system intervenes in the perception of external objects, it is a faithful intermediary which should not work any change on those physical actions which it gathers from outside to transmit to our consciousness. From this point of view colour would exist as colour, outside our eyes, sound would exist as sound, and in a general way there would not be, in matter, any mysterious property left, since we should perceive matter as it is. This is a very unexpected interpretation, by which men of science have come to acknowledge the correctness of the common belief; they rehabilitate an opinion which philosophers have till now turned

to ridicule, under the name of naïve realism. All which proves that the naïveté of some may be the excessive refinement of others.

To establish scientifically this opinion they batter down the theory of the specific energy of the nerves. I have recalled in a previous page[1] of what this theory consists. I have shown that if, by mechanical or electrical means, our different sensory nerves are excited, notwithstanding the identity of the excitant, a different sensation is provoked in each case—light when the optic nerve is stimulated, sound when the acoustic, and so on. It is now answered to this argument based on fact that the nature of these excitants must be complex. It is not impossible, it is thought, that the electric force contains within itself both luminous and sonorous actions; it is not impossible that a mechanical excitement should change the electric state of the nerve affected, and that, consequently, these subsidiary effects explain how one and the same agent may, according to the nerves employed, produce different effects.

3. After the spiritualists and the experimentalists, let us take the metaphysicians. Among them one has always met with the most varying specimens of opinions and with arguments for and against all possible theories.

Thus it is, for example, with the external percep-

[1] See p. 22, *sup.*—ED.

tion. Some have supposed it indirect, others, on the contrary, that it acts directly on the object. Those who uphold the direct theory are inspired by Berkeley, who asserts that the sensitive qualities of the body have no existence but in our own minds, and consist really in representative ideas. This doctrine is expressly based on this argument —that thought differs too much in nature from matter for one to be able to suppose any link between these two substances. In this particular, some authors often make an assertion without endeavouring to prove it. They are satisfied with attesting, or even with supposing, that mind can have no consciousness of anything but its own states. Other philosophers, as I have said, maintain that "things which have a real existence are the very things we perceive." It is Thomas Reid who has upheld, in some passages of his writings at all events, the theory of instantaneous perception, or intuition. It has also been defended by Hamilton in a more explicit manner.[1] It has been taken up again in recent years, by a profound and subtle philosopher, M. Bergson, who, unable to admit that the nervous system is a *substratum of knowledge* and serves us as a percipient, takes it to be solely a motor organ, and urges that the sensory parts of the system—that is

[1] See J. S. MILL'S *Examination of Sir Wm. Hamilton's Philosophy*, chap. x. p. 176, *et seq.*

to say, the centripetal, optic, acoustic, &c., nerves —do not call forth, when excited, any kind of sensation, their sole purpose being to convey disturbances from periphery to periphery, or, say, from external objects to the muscles of the body. This hypothesis, surely a little difficult to comprehend, places, if I mistake not, the mind, as a power of perception and representation, within the interval comprised between the external object and the body, so that the mind is in direct contact with external objects and knows them as they are.

It will be noticed that these three interpretations, the spiritualistic, the experimental, and the metaphysical, are in formal opposition with that which I have set forth earlier in these pages. They deny the supposition that the nervous system serves us as an intermediary with nature, and that it transforms nature before bringing it to our consciousness. And it might seem that by contradicting my fundamental proposition, these three new hypotheses must lead to a totally different conclusion.

Now, this is not so at all. The conclusion I have enunciated remains entirely sound, notwithstanding this change in the starting point, and for the following reason. It is easy to see that we cannot represent to ourselves the inner structure of matter by using all our sensations without distinction, because it is impossible to bring all

these sensations within one single and identical synthetic construction: for this they are too dissimilar. Thus, we should try in vain to unite in any kind of scheme a movement of molecules and an odour; these elements are so heterogeneous that there is no way of joining them together and combining them.

The physicists have more or less consciously perceived this, and, not being able to overcome by a frontal attack the difficulty created by the heterogeneity of our sensations, they have turned its flank. The ingenious artifice they have devised consists in retaining only some of these sensations, and in rejecting the remainder; the first being considered as really representing the essence of matter, and the latter as the effects of the former on our organs of sense; the first being reputed to be true, we may say, and the second being reputed false — that is subjective, that is not representing the *X* of matter.[1] I have refuted this argument by showing that all our sensations without exception are subjective and equally false in regard to the *X* of matter, and that no one of them, consequently, has any claim to explain the others.

Now, by a new interpretation, we are taught that all sensations are equally true, and that all faithfully represent the great *X*. If they be all

[1] See p. 18, *sup.*—Ed.

equally true, it is absolutely the same as if they were all false; no one sensation can have any privilege over the others, none can be truer than the others, none can be capable of explaining the others, none can usurp to itself the sole right of representing the essence of matter; and we thus find ourselves, in this case, as in the preceding, in presence of the insurmountable difficulty of creating a synthesis with heterogeneous elements.

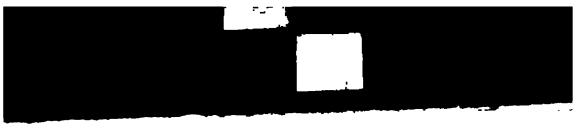
All that has been said above is summed up in the following points:—

1. Of the external world, we only know our sensations. All the physical properties of matter resolve themselves for us into sensations, present, past, or possible. We may not say that it is by the intermediary, by the means of sensation, that we know these properties, for that would mean that the properties are distinct from the sensations. Objects are to us in reality only aggregates of sensations.

2. The sensations belong to the different organs of the senses—sight, hearing, touch, the muscular sense, &c. Whatever be the sense affected, one sensation has the same rights as the others, from the point of view of the cognition of external objects. It is impossible to distinguish them into subjective and objective, by giving to this distinction the meaning that certain sensations

represent objects as they are, while certain others simply represent our manner of feeling. This is an illegitimate distinction, since all sensations have the same physiological condition, the excitement of a sensory nerve, and result from the properties of this nerve when stimulated.

3. Consequently, it is impossible for us to form a conception of matter in terms of movement, and to explain by the modalities of movement the properties of bodies; for this theory amounts to giving to certain sensations, especially those of the muscular sense, the hegemony over the others. We cannot explain, we have not the right to explain, one sensation by another, and the mechanical theory of matter has simply the value of a symbol.



BOOK II

THE DEFINITION OF MIND

CHAPTER I

THE DISTINCTION BETWEEN COGNITION[1] AND ITS OBJECT

AFTER having thus studied matter and reduced it to sensations, we shall apply the same method of analysis to mind, and inquire whether mind possesses any characteristic which allows it to be distinguished from matter.

Before going any further, let me clear up an ambiguity. All the first part of this work has been devoted to the study of what is known to us in and by sensation; and I have taken upon myself, without advancing any kind of justifying reason, to call that which is known to us, by this method, by the name of matter, thus losing sight of the fact that matter only exists by contradistinction and opposition to mind, and that if mind did not exist, neither would matter. I have thus appeared to prejudge the question to be resolved.

The whole of this terminology must now be considered as having simply a conventional value,

[1] See note on p. 14, *sup.*—ED.

and must be set aside for the present. These are the precise terms in which this question presents itself to my mind. A part of the knowable consists in sensations. We must, therefore, without troubling to style this aggregate of sensations *matter* rather than *mind*, make an analysis of the phenomena known by the name of mind, and see whether they differ from the preceding ones. Let us, therefore, make an inventory of mind. By the process of enumeration, we find quoted as psychological phenomena, the sensations, the perceptions, the ideas, the recollections, the reasonings, the emotions, the desires, the imaginations, and the acts of attention and of will. These appear to be, at the first glance, the elements of mind; but, on reflection, one perceives that these elements belong to two distinct categories, of which it is easy to recognise the duality, although, in fact and in reality, these two elements are constantly combined. The first of these elements may receive the generic name of objects of cognition, or objects known, and the second that of acts of cognition.

Here are a few examples of concrete facts, which only require a rapid analysis to make their double nature plain. In a sensation which we feel are two things: a particular state, or an object which one knows, and the act of knowing it, of feeling it, of taking cognisance of it; in other

words, every sensation comprises an impression and a cognition. In a recollection there is, in like manner, a certain image of the past and the fact consisting in the taking cognisance of this image. It is, in other terms, the distinction between the intelligence and the object. Similarly, all reasoning has an object; there must be matter on which to reason, whether this matter be supplied by the facts or the ideas. Again, a desire, a volition, an act of reflection, has need of a point of application. One does not will in the air, one wills something; one does not reflect in the void, one reflects over a fact or over some difficulty.

We may then provisionally distinguish in an inventory of the mind a something which is perceived, understood, desired, or willed, and, beyond that, the fact of perceiving, of understanding, or desiring, or of willing.

To illustrate this distinction by an example, I shall say that an analogous separation can be effected in an act of vision, by showing that the act of vision, which is a concrete operation, comprises two distinct elements: the object seen and the eye which sees. But this is, of course, only a rough comparison, of which we shall soon see the imperfections when we are further advanced in the study of the question.

To this activity which exists and manifests

itself in the facts of feeling, perceiving, &c., we can give a name in order to identify and recognise it: we will call it the consciousness[1] (*la conscience*), and we will call object everything which is not the act of consciousness.

After this preliminary distinction, to which we shall often refer, we will go over the principal manifestations of the mind, and we will first study the objects of cognition, reserving for another chapter the study of the acts of cognition—that is to say, of consciousness. We will thus examine successively sensation, idea, emotion, and will.

It has been often maintained that the peculiar property of mind is to perceive sensations. It has also been said that thought—that is, the property of representing to one's self that which does not exist—distinguishes mind from matter. Lastly, it has not failed to be affirmed that one thing which the mind brings into the material

[1] The word "*conscience*" is one of those which has been used in the greatest number of different meanings. Let it be, at least, understood that I use it here in an intellectual and not a moral sense. I do not attach to the conscience the idea of a moral approbation or disapprobation, of a duty, of a remorse. The best example to illustrate conscience has, perhaps, been formed by LADD. It is the contrast between a person awake and sleeping a dreamless sleep. The first has consciousness of a number of things; the latter has consciousness of nothing. Let me now add that we distinguish from consciousness that multitude of things of which one has consciousness of. Of these we make the object of consciousness. [*Conscience* has throughout been rendered "consciousness."—ED.]

world is its power of emotion; and moralists, choosing somewhat arbitrarily among certain emotions, have said that the mind is the creator of goodness. We will endeavour to analyse these different affirmations.

CHAPTER II

DEFINITION OF SENSATION

WHEN making the analysis of matter we impliedly admitted two propositions: first, that sensation is the *tertium quid* which is interposed between the excitant of our sensory nerves and ourselves; secondly, that the aggregate of our sensations is all we can know of the outer world, so that it is correct to define this last as the collection of our present, past, and possible sensations. It is not claimed that the outer world is nothing else than this, but it is claimed with good reason that the outer world is nothing else *to us*.

It would be possible to draw from the above considerations a clear definition of sensation, and especially it would be possible to decide henceforth from the foregoing whether sensation is a physical or a mental phenomenon, and whether it belongs to matter or to mind. This is the important point, the one which we now state, and which we will endeavour to resolve. To make the question clearer, we will begin it afresh,

as if it were new, and as if the facts hitherto analysed did not already prejudge the solution. Let us begin by giving a definition of sensation from the point of view of experimental psychology.

Sensation, then, is the phenomenon which is produced and which one experiences when an excitant has just acted on one of our organs of sense. This phenomenon is therefore composed of two parts: an action exercised from outside by some body or other on our nervous substance; and, then, the fact of feeling this action.

This fact of feeling, this state of consciousness, is necessary to constitute sensation; when it does not exist, it is preferable to give the phenomenon another name, otherwise the fault is committed of mixing up separate facts. Physiologists have, on this point, some faults of terminology with which to reproach themselves; for they have employed the word sensibility with too little of the critical spirit. Sensibility, being capacity for sensation, presupposes, like sensation itself, consciousness. It has, therefore, been wrong, in physiology, to speak of the sensibility of the tissues and organs, which, like the vegetable tissues or the animal organs of vegetative life, properly speaking, feel nothing, but react by rapid or slow movements to the excitements they are made to receive. Reaction, by a movement or any kind of modification, to an excitement, does not consti-

tute a sensation unless consciousness is joined with it, and, consequently, it would be wiser to give unfelt excitements and reactions the name of excitability.

The clearest examples of sensation are furnished by the study of man, and are taken from cases where we perceive an external object. The object produces upon us an action, and this action is felt; only, in such cases, the fact of sensation comprises but a very small part of the event. It only corresponds, by definition, to the actual action of the object. Analysis after analysis has shown that we constantly perceive far beyond this actual action of objects. Our mind, as we say, outruns our senses. To our sensations, images come to attach themselves which result from sensations anteriorly felt in analogous circumstances. These images produce in us an illusion, and we take them for sensations, so that we think we perceive something which is but a remembrance or an idea; the reason being that our mind cannot remain in action in the presence of a sensation, but unceasingly labours to throw light upon it, to sound it, and to arrive at its meaning, and consequently alters it by adding to it. This addition is so constant, so unavoidable, that the existence of an isolated sensation which should be perceived without the attachment of images, without modification or interpretation,

is well-nigh unrealisable in the consciousness of an adult. It is a myth.

Let us, however, imagine this isolation to be possible, and that we have before us a sensation free from any other element. What is this sensation? Does it belong to the domain of physical or of moral things? Is it a state of matter or of mind?

I can neither doubt nor dispute that sensation is, in part, a psychological phenomenon, since I have admitted, by the very definition I have given of it, that sensation implies consciousness. We must, therefore, acknowledge those who define it as *a state of consciousness* to be right, but it would be more correct to call it the *consciousness of a state*, and it is with regard to the nature of this state that the question presents itself. It is only this state which we will now take into consideration. It is understood that sensation contains both an impression and a cognition. Let us leave till later the study of the act of cognition, and deal with the impression. Is this impression now of a physical or a mental nature? Both the two opposing opinions have been upheld. In this there is nothing astonishing, for in metaphysics one finds the expression of every possible opinion. But a large, an immense majority of philosophers has declared in favour of the psychological nature of the impression. Without even making the

above distinction between the impression and the act of cognition, it has been admitted that the entire sensation, taken *en bloc*, is a psychological phenomenon, a modification of our consciousness and a peculiar state of our minds. Descartes has even employed this very explicit formula: "The objects we perceive are within our understanding." It is curious to see how little trouble authors take to demonstrate this opinion; they declare it to be self-evident, which is a convenient way of avoiding all proof. John Stuart Mill has no hesitation in affirming that: "The mind, in perceiving external objects, can only take notice of its own conditions." And Renouvier expresses the same arbitrary assertion with greater obscurity when he writes: "The monad is constituted by this relation: the connection of the subject with the object within the subject."[1] In other words, it is laid down as an uncontrovertible principle that "the mental can only enter into direct relations with the mental." That is what may be called "the principle of Idealism."

This principle seems to me very disputable, and it is to me an astonishing thing that the most resolute of sceptics—Hume, for example—should have accepted it without hesitation. I shall first enunciate my personal opinion, then make known

[1] Ch. Renouvier et L. Prat, *La Nouvelle Monadologie*, p. 148.

another which only differs from mine by a difference of words, and finally I will discuss a third opinion, which seems to me radically wrong.

My personal opinion is that sensation is of a mixed nature. It is psychical in so far as it implies an act of consciousness, and physical otherwise. The impression on which the act of cognition operates, that impression which is directly produced by the excitant of the nervous system, seems to me, without any doubt, to be of an entirely physical nature. This opinion, which I make mine own, has only been upheld by very few philosophers —Thomas Reid perhaps, and William Hamilton for certain; but neither has perceived its deep-lying consequences.

What are the arguments on which I rely? They are of different orders, and are arguments of fact and arguments of logic. I shall first appeal to the natural conviction of those who have never ventured into metaphysics. So long as no endeavour has been made to demonstrate the contrary to them, they believe, with a natural and naïve belief, that matter is that which is seen, touched and felt, and that, consequently, matter and our senses are confounded. They would be greatly astonished to be informed that when we appear to perceive the outer world, we simply perceive our ideas; that when we take the train for

Lyons we enter into one state of consciousness in order to attain another state of consciousness.

Now, the adherents of this natural and naïve opinion have, as they say in the law, the right of possession (*possession d'état*); they are not plaintiffs but defendants; it is not for them to prove they are in the right, it has to be proved against them that they are in the wrong. Until this proof is forthcoming they have a presumption in their favour.

Are we here making use of the argument of common opinion of mankind, of which ancient philosophy made so evident an abuse? Yes, and no. Yes, for we here adopt the general opinion. No, for we only adopt it till the contrary be proved. But who can exhibit this proof to the contrary? On a close examination of the question, it will be perceived that sensation, taken as an object of cognition, becomes confused with the properties of physical nature, and is identified with them, both by its mode of apparition and by its content. By its mode of apparition, sensation holds itself out as independent of us, for it is at every instant an unexpected revelation, a source of fresh cognitions, and it offers a development which takes place without and in spite of our will; while its laws of co-existence and of succession declare to us the order and march of the material universe. Besides, by its content, sensation is confounded

with matter. When a philosopher seeks to represent to himself the properties of a material object, —of a brain, for example—in order to contrast them with the properties of a psychical activity, it is the properties of sensation that he describes as material; and, in fact, it is by sensation, and sensation alone, that we know these properties. Sensation is so little distinct from them that it is an error to consider it as a means, a process, an instrument for the knowledge of matter. All that we know of matter is not known in or by sensation, but constitutes sensation itself; it is not by the aid of sensation that we know colour; colour is a sensation, and the same may be said of form, resistance, and the whole series of the properties of matter. They are only our sensations clothed with external bodies. It is therefore absolutely legitimate to consider a part of our sensations, the object part, as being of physical nature. This is the opinion to which I adhere.

We come to the second opinion we have formulated. It is, in appearance at least, very different from the first. Its supporters agree that the entire sensation, taken *en bloc* and unanalysed, is to be termed a psychological phenomenon. In this case, the act of consciousness, included in the sensation, continues to represent a psychical element. They suppose, besides, that the object on which this act operates is psychical;

and finally, they suppose that this object or this impression was provoked in us by a physical reality which is kept in concealment, which we do not perceive, and which remains unknowable.

This opinion is nowise absurd in itself: but let us examine its consequences. If we admit this thesis, that sensations are manifestations of mind which, although provoked by material causes, are of a purely mental nature, we are forced to the conclusion that we know none of the properties of material bodies, since we do not enter into relations with these bodies. The object we apprehend by perception is, according to this hypothesis, solely mental. To draw therefrom any notion on material objects, it would have to be supposed that, by some mysterious action, the mental which we know resembles the physical which we do not know, that it retains the reflection of it, or even that it allows its colour and form to pass, like a transparent pellicle applied on the contour of bodies. Here are hypotheses very odd in their realism. Unless we accept them, how is it comprehensible that we can know anything whatever of physical nature? We should be forced to acknowledge, following the example of several philsophers, that the perception of the physical is an illusion.

As a compensation, that which this system

takes from matter it attributes to mind, which turns our familiar conceptions upside down. The qualities of sensation detached from matter will, when applied to mind, change its physiognomy. There are sensations of extent, weight, space, and form. If these sensations are turned into psychical events, we shall have to grant to these events, to these manifestations of the mind, the properties of extent, of weight, of form. We shall have to say that mind is a resisting thing, and that it has colour.

It may be said that this fantasy of language is not very serious. So be it. But then what remains of the dualism of mind and matter? It is at least singularly compromised. We may continue to suppose that matter exists, and even that it is matter which provokes in our mind those events which we call our sensations; but we cannot know if by its nature, its essence, this matter differs from that of mind, since we shall be ignorant of all its properties. Our ignorance on this point will be so complete that we shall not even be able to know whether any state which we call mental may not be physical. The distinction between physical and mental will have lost its *raison d'être*, since the existence of the physical is necessary to give a meaning to the existence of the mental. We are brought, whether we like it or not, to an experimental monism, which is neither psychical nor

physical; panpsychism and panmaterialism will have the same meaning.[1]

But this monism can be only transitory, for it is more in the words than in the thing itself. It is brought about by the terminology adopted, by the resolution to call mental all the phenomena that it is possible to know. Luckily, our speculations are not at the mercy of such trifling details as the details of language. Whatever names may be given to this or that, it will remain none the less true that nature will continue to present to us a contrast between phenomena which are flints, pieces of iron, clods of earth, brains—and some other phenomena which we call states of consciousness. Whatever be the value of this dualism, it will have to be discussed even in the hypothesis of panpsychism.[2] As for myself, I shall also continue to make a distinction between what I have called objects of cognition and acts of cognition, because this is the most general distinction that can be traced in the immense field of our cognitions. There is no other which succeeds, to the same degree, in dividing this field into two, moreover, this distinction is derived directly from observation,

[1] An American author, MORTON PRINCE, lately remarked this: *Philosophical Review*, July 1904, p. 450.

[2] This FLOURNOY recently has shown very wittily. See in *Arch. de Psychol.*, Nov. 1904, his article on Panpsychism.

and does not depend for its validity on the physical or mental nature of the objects. Here is, then, a duality, and this duality, even when it does not bear the names physical and moral, should necessarily play the same part, since it corresponds to the same distinction of fact.

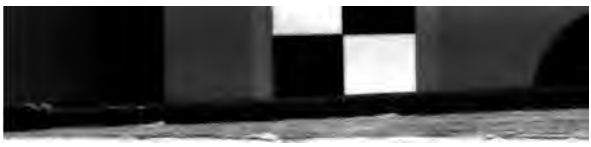
In the end, nothing will be changed, and this second opinion must gradually merge into the one first stated by me, and of which I take the responsibility. We may, therefore, put it out of consideration.

I have mentioned a third opinion, stating that it appeared to me to be radically false. Outwardly it is the same as the last; looked at superficially it seems even confused with it; but, in reality it is of a totally different nature. It supposes that sensation is an entirely psychological phenomenon. Then, having laid down this thesis, it undertakes to demonstrate it by asserting that sensation differs from the physical fact, which amounts to supposing that we cannot know anything but sensations, and that physical facts are known to us directly and by another channel. This is where the contradiction comes in. It is so apparent that one wonders how it has been overlooked by so many excellent minds. In order to remove it, it will be sufficient to recollect that we do not know anything other than sensations; it is therefore impossible to make any distinction

between the physical object and the object of cognition contained in every sensation. The line of demarcation between the physical and the moral cannot pass this way, since it would separate facts which are identical.

We can, therefore, only deplore the error of all those who, to express the difference between mind and matter, have sought a contrast between sensation and physical facts. Physiologists, with hardly an exception, have fallen into this error; when contemplating in imagination the material working of the brain, they have thought that between the movement of cerebral matter and sensation there was a gulf fixed. The comparison, to have been correct, required to be presented in quite another way. A parallel, for instance, should have been drawn between a certain cerebral movement and the act of consciousness, and there should have been said: "The cerebral motion is the physical phenomenon, the act of consciousness the psychical." But this distinction has not been made. It is sensation *en bloc* which is compared to the cerebral movement, as witness a few passages I will quote as a matter of curiosity, which are borrowed from philosophers and, especially, from physiologists.

While philosophers take as a principle of idealism, that the mental can only know the mental, physiologists take, as a like principle,



the heterogeneity existing, or supposed to exist, between the nerve impression and the sensation. "However much we may follow the excitement through the whole length of the nerve," writes Lotze,[1] "or cause it to change its form a thousand times and to metamorphose itself into more and more delicate and subtle movements, we shall never succeed in showing that a movement thus produced can, by its very nature, cease to exist as movement and be reborn in the shape of sensation. . . ." It will be seen that it is on the opposition between molecular movement and sensation, that Lotze insists. In like manner Ferrier: "But how is it that the molecular modifications in the cerebral cells coincide with the modifications of the consciousness; how, for instance, do luminous vibrations falling upon the retina excite the modification of consciousness called *visual sensation?* These are problems we cannot solve. We may succeed in determining the exact nature of the molecular changes which take place in the cerebral cells when a sensation is felt; but this will not bring us an inch nearer to the explanation of the fundamental nature of sensation." Finally, Du Bois Reymond, in his famous discussion in 1880, on the seven enigmas

[1] This extract, together with the two subsequent, are borrowed from an excellent lecture by FLOURNOY, on *Métaphysique et Physiologie.* Georg: Geneva, 1890.

of the world, speaks somewhat as follows: "The astronomical knowledge of the encephalon, that is, the most intimate to which we can aspire, only reveals to us matter in motion. But no arrangement nor motion of material particles can act as a bridge by which we can cross over into the domain of intelligence. . . . What imaginable link is there between certain movements of certain molecules in my brain, on the one hand, and on the other hand primitive, undefinable, undeniable facts such as: I have the sensation of softness, I smell the odour of a rose, I hear the sound of an organ, I see a red colour, &c. . . ."

These three quotations show very conclusively that their authors thought they could establish the heterogeneity of the two phenomena by opposing matter to sensation. It must be recognised that they have fallen into a singular error; for matter, whatever it may be, is for us nothing but sensation; matter in motion, I have often repeated, is only a quite special kind of sensation; the organic matter of the brain, with its whirling movements of atoms, is only sensation. Consequently, to oppose the molecular changes in the brain to the sensation of red, blue, green, or to an undefined sensation of any sort, is not crossing a gulf, and bringing together things which cannot be compared, it is simply comparing one sensation to another sensation.

There is evidently something equivocal in all this; and I pointed this out when outlining and discussing the different theories of matter. It consists in taking from among the whole body of sensations certain of them which are considered to be special, and which are then invested with the privilege of being more important than the rest and the causes of all the others. This is about as illegitimate as to choose among men a few individuals to whom is attributed the privilege of commanding others by divine right. These privileged sensations which belong to the sight, the touch, and the muscular sense, and which are of large extent, are indeed extensive. They have been unduly considered as objective and as representing matter because they are better known and measurable, while the other sensations, the unextensive sensations of the other senses, are considered as subjective for the reasons that they are less known and less measurable: and they are therefore looked on as connected with our sensibility, our Ego, and are used to form the moral world.

We cannot subscribe to this way of establishing the contrast between matter and thought, since it is simply a contrast between two categories of sensations, and I have already asserted that the partitioning-out of sensations into two groups having different objective values, is arbitrary.

CHAPTER III

DEFINITION OF THE IMAGE

GOING on with our inventory, after sensations come images, ideas, and concepts; in fact, quite a collection of phenomena, which are generally considered as essentially psychological.

So long as one does not carefully analyse the value of ideas, one remains under the impression that ideas form a world apart, which is sharply distinguished from the physical world, and behaves towards it as an antithesis. For is not conception the contrary of perception? and is not the ideal in opposition to reality?

Thoughts have some characteristics of fancy, of freedom, even of unreality, which are wanting to the prosaicness of heavy material things. Thoughts sport with the relations of time and space; they fly in a moment across the gulf between the most distant objects; they travel back up the course of time; they bring near to us events centuries away; they conceive objects which are unreal; they imagine combinations which upset all physical laws, and, further, these conceptions remain invi-

sible to others as well as to ourselves. They are outside the grip of reality, and constitute a world which becomes, for any one with the smallest imagination, as great and as important as the world called real. One may call in evidence the poets, novelists, artists, and the dreamers of all kinds. When life becomes too hard for us, we fly to the ideal world, there to seek forgetfulness or compensation.

It is, therefore, easy to understand, that it should have been proposed to carry into ideation the dichotomy between the physical and the moral. Many excellent authors have made the domain of the mind begin in the ideal. Matter is that which does not think. Descartes, in his *Discours de la Méthode* (4th part), remarking that he may pretend "not to have a body, and that there is no world or place in which he exists, but that he cannot pretend that he does not think," concludes by saying that the mind is "a substance, all whose essence or nature is merely to think, and which has no need of either place or any other material thing, in order to exist;" in short, that "the soul is absolutely distinct from the body."[1]

[1] Let me say, in passing, that this separation that DESCARTES thinks he can establish between perception and ideation, is only conceivable on condition that it be not too closely examined, and that no exact definition of ideation be given. If we remark, in fact, that all thought is a reproduction, in some degree, of a sensation, we arrive at this conclusion: that a thought operated

Let us, then, examine in what measure this separation between perception and ideation can be legitimately established. If we accept this separation, we must abandon the distinction I proposed between acts and objects of cognition, or, at least, admit that this distinction does not correspond to that between the physical and the moral, since thoughts, images, recollections, and even the most abstract conceptions, all constitute, in a certain sense, objects of cognition. They are phenomena which, when analysed, are clearly composed of two parts, an object and a cognition. Their logical composition is, indeed, that of an external perception, and there is in ideation exactly the same duality as in sensation. Consequently, if we maintain the above distinction as a principle of classification for all knowable phenomena, we shall be obliged to assign the same position to ideas as to sensations.

The principal difference we notice between sensation and idea is, it would seem, the character of unreality in the last named; but this opposition has not the significance we imagine. Our mental

by a soul distinct from the body would be a thought completely void and without object, it would be the thought of nothingness. It is not, therefore, conceivable. Consequently the criterion, already so dangerous, which DESCARTES constantly employs—to wit: that what we clearly conceive is true—cannot apply to thought, if we take the trouble to analyse it and to replace a purely verbal conception by intuition.

vision only assumes this wholly special character of unreality under conditions in which it is unable to harmonise with the real vision. Taine has well described the phases of the reduction of the image by sensation: it is at the moment when it receives the shock of an image which contradicts it, that the image appears as illusory.[1] Let us suppose that we are sitting down, dreaming and watching the passing by of our images. If, at this moment, a sudden noise calls us back to reality, the whole of our mental phantasmagoria disappears as if by the wave of a magic wand, and it is by thus vanishing that the image shows its falsity. It is false because it does not accord with the present reality.

But, when we do not notice a disagreement between these two modes of cognition, both alike give us the impression of reality. If I evoke a reminiscence and dwell attentively on the details, I have the impression that I am in face of the reality itself. "I feel as if I were there still," is a common saying; and, among the recollections I evoke, there are some which give me the same

[1] I somewhat regret that TAINE fell into the common-place idea of the opposition of the brain and thought; he took up again this old idea without endeavouring to analyse it, and only made it his own by the ornamentation of his style. And as his was a mind of powerful systematisation, the error which he committed led him into much wider consequences than the error of a more common mind would have done.

certitude as the perception of the moment. Certain witnesses would write their depositions with their blood. One does not see this every day; but still one does see it.

Further, there are thousands of circumstances where the ideation is neither in conflict with the perception nor isolated from it, but in logical continuity with it. This continuity must even be considered as the normal condition. We think in the direction of that which we perceive. The image seems to prepare the adaptation of the individual to his surroundings; it creates the foresight, the preparation of the means, and, in a word, everything which constitutes for us a final cause. Now, it is very necessary that the image appear real to be usefully the substitute of the sensation past or to come.

Let us establish one thing more. Acting as a substitute, the image not only appears as real as the sensation, it appears to be of the same nature; and the proof is that they are confounded one with the other, and that those who are not warned of the fact take one for the other. Every time a body is perceived, as I previously explained, there are images which affix themselves to the sensation unnoticed. We think we perceive when we are really remembering or imagining. This addition of the image to the sensation is not a petty and insignificant accessory; it forms the

major part, perhaps nine-tenths, of perception. Hence arise the illusions of the senses, which are the result, not of sensations but of ideas. From this also comes the difficulty of knowing exactly what, under certain circumstances, is observation or perception, where the fact perceived ends, and where conjecture begins. Once acquainted with all these possibilities of errors, how can we suppose a radical separation between the sensation and the image?

Examined more closely, images appear to us to be divisible into as many kinds as sensations: visual images correspond to visual sensations, tactile to tactile, and so on with all the senses.

That which we experience in the form of sensation, we can experience over again in the form of image, and the repetition, generally weaker in intensity and poorer in details, may, under certain favourable circumstances, acquire an exceptional intensity, and even equal reality: as is shown by hallucinations. Here, certainly, are very sound reasons for acknowledging that the images which are at the bottom of our thoughts, and form the object of them, are the repetition, the modification, the transposition, the analysis or the synthesis of sensations expérienced in the past, and possessing, in consequence, all the characteristics of bodily states. I believe that there is neither more nor less spirituality

in the idea than in the sensation. That which forms its spirituality is the implied act of cognition; but its object is material.

I foresee a final objection: I shall be told that even when the unreality of the image is not the rule, and appears only under certain circumstances, it nevertheless exists. This is an important fact. It has been argued from the unreality of dreams and hallucinations in which we give a body to our ideas, that we do not in reality perceive external bodies, but simply psychical states and modifications of our souls. If our ideas consist—according to the hypothesis I uphold—in physical impressions which are felt, we shall be told that these particular impressions must participate in the nature of everything physical; that they are real, and always real; that they cannot be unreal, fictitious, and mendacious, and that, consequently, the fictitious character of ideation becomes inexplicable.

Two words of answer are necessary to this curious argument, which is nothing less than an effort to define the mental by the unreal, and to suppose that an appearance cannot be physical. No doubt, we say, every image, fantastical as it may seem as signification, is real in a certain sense, since it is the perception of a physical impression; but this physical nature of images does not prevent our making a distinction between

true and false images. To take an analogous example: we are given a sheet of proofs to correct, we delete certain redundant letters, and, although they are printed with the same type as the other letters, we have the right to say they are false. Again, in a musical air, we may hear a false note, though it is as real as the others, since it has been played. This distinction between reality and truth ought to be likewise applied to mental images. All are real, but some are false. They are false when they do not accord with the whole reality; they are true when they agree; and every image is partly false because, being an image, it does not wholly accord with the actual perceptions. It creates a belief in a perception which does not occur; and by developing these ideas we could easily demonstrate how many degrees of falsehood there are.

Physiologically, we may very easily reconcile the falsity of the image with the physical character of the impression on which it is based. The image results from a partial cerebral excitement, which sensation results from an excitement which also acts upon the peripheral sensory nerves, and corresponds to an external object—an excitant which the image does not possess. This difference explains how it is that the image, while resulting from a physical impression, may yet be in a great number of cases declared false—that

is to say, may be recognised as in contradiction to the perceptions.

To other minds, perhaps, metaphysical reasoning will be more satisfactory. For these, we propose to make a distinction between two notions, Existence or Reality, on the one hand, and Truth, on the other.

Existence or Reality is that of which we have an immediate apprehension. This apprehension occurs in several ways. In perception, in the first place. I perceive the reality of my body, of a table, the sky, the earth, in proportion to my perception of them. They exist, for if they did not, I could not perceive them. Another way of understanding reality is conception or thought. However much I may represent a thing to myself as imaginary, it nevertheless exists in a certain manner, since I can represent it to myself. I therefore, in this case, say that it is real or it exists. It is of course understood, that in these definitions I am going against the ordinary acceptation of the terms; I am taking the liberty of proposing new meanings. This reality is, then, perceived in one case and conceived in the other. Perceptibility or conceivability are, then, the two forms which reality may assume. But *reality* is not synonymous with *truth;* notwithstanding the custom to the contrary, we may well introduce a difference between these two terms. Reality is that which is perceived or

conceived; truth is that which accords with the whole of our knowledge. Reality is a function of the senses or of ideation; truth is a function of reasoning or of the reason.

For cognition to be complete, it requires the aid of all these functions. And, in fact, what does conception by itself give? It allows us to see if a thing is capable of representation. This is not a common-place thing, I will observe in passing; for many things we name are not capable of representation, and there is often a criticism to be made; we think we are representing, and we are not. What is capable of representation exists as a representation, but is it true? Some philosophers have imagined so, but they are mistaken; what we succeed in conceiving is alone possible.

Let us now take the Perceptible. Is what one perceives true? Yes, in most cases it is so in fact; but an isolated perception may be false, and disturbed by illusions of all kinds. It is all very well to say, "I see, I touch." There is no certainty through the senses alone in many circumstances that the truth has been grasped. If I am shown the spirit of a person I know to be dead, I shall not, notwithstanding the testimony of my eyes, believe it to be true, for this apparition would upset all my system of cognitions.

Truth is that which, being deemed conceivable, and being really perceived, has also the quality

of finding its place, its relation, and its confirmation in the whole mass of cognitions previously acquired.

These distinctions,[1] if developed, would readily demonstrate that the advantages of observation are not eclipsed by those of speculation; and that those of speculation, in their turn, do not interfere with those of observation. But we have not time to develop these rules of logic; it will be sufficient to point out their relation to the question of the reality of mental images. Here are my conclusions in two words. Physical phenomena and images are always real, since they are perceived or conceived; what is sometimes wanting to them, and makes them false, is that they do not accord with the rest of our cognitions.[2]

Thus, then, are all objections overruled, in my opinion at least. We can now consider the world

[1] I have just come across them again in an ingenious note of C. L. HERRICK: *The Logical and Psychological Distinction between the True and the Real* (*Psych. Rev.*, May 1904). I entirely agree with this author. But it is not he who exercised a suggestion over my mind; it was M. BERGSON. See *Matière et Mémoire*, p. 159.

[2] In order to remain brief, I have not thought fit to allude in the text to a question of metaphysics which closely depends on the one broached by me: the existence of an outer world. Philosophers who define sensation as a modality of our Ego are much embarrassed later in demonstrating the existence of an outer world. Having first admitted that our perception of it is illusory, since, when we think we perceive this world, we have simply the feeling of the modalities of our Ego, they find themselves powerless to demonstrate that this illusion corresponds to

of ideas as a physical world; but it is one of a peculiar nature, which is not, like the other, accessible to all, and is subject to its own laws, which are laws of association. By these very different characteristics, it separates itself so sharply from the outer world that all endeavour to bring the two together seems shocking; and it is very easy to understand that many minds should wish to remain faithful to the conception that ideas form a mental or moral world. No metaphysical reasoning could prevail against this sentiment, and we must give up the idea of destroying it. But we think we have shown that idea, like sensation, comprises at the same time the physical and the mental.

a truth, and invoke in despair, for the purpose of their demonstration, instinct, hallucination, or some *a priori* law of the mind. The position we have taken in the discussion is far more simple. Since every sensation is a fragment of matter perceived by a mind, the aggregate of sensations constitutes the aggregate of matter. There is in this no deceptive appearance, and consequently no need to prove a reality distinct from appearances. As to the argument drawn from dreams and hallucinations which might be brought against this, I have shown how it is set aside by a distinction between perceptibility and truth. It is no longer a matter of perception, but of reasoning. In other words, all that we see, even in dreams, is real, but is not in its due place.

CHAPTER IV

DEFINITION OF THE EMOTIONS

AFTER sensations and images, we have to name among the phenomena of consciousness, the whole series of affective states—our pleasures and our pains, our joys and our griefs, our sentiments, our emotions, and our passions. It is universally admitted that these states are of a mental nature, for several reasons. (1) We never objectivate them as we do our sensations, but we constantly consider them as indwelling or subjective states. This rule, however, allows an exception for the pleasure and the pain termed physical, which are often localised in particular parts of our bodies, although the position attributed to them is less precise than with indifferent sensations. (2) We do not alienate them as we do our indifferent sensations. The sensations of weight, of colour, and of form serve us for the construction of bodies which appear to us as perceived by us, but as being other than ourselves. On the contrary, we constantly and without hesitation refer our emotional states to our *Ego*. It is I

who suffer, we say, I who complain, I who hope. It is true that this attribution is not absolutely characteristic of mental phenomena, for it happens that we put a part of our Ego into material objects, such as our bodies, and even into objects separate from our bodies, and whose sole relation to us is that of a legal proprietorship. We must guard against the somewhat frequent error of identifying the Ego with the psychical.

These two reasons sufficiently explain the tendency to see only psychological states in the emotional ones; and, in fact, those authors who have sought to oppose mind to matter have not failed to introduce emotion into their parallel as representing the essence of mind. On this point I will recall the fine ironical image used by Tyndall, the illustrious English physicist, to show the abyss which separates thought from the molecular states of the brain. "Let us suppose," he says, "that the sentiment love, for example, corresponds to a right-hand spiral movement of the molecules of the brain and the sentiment hatred to a left-hand spiral movement. We should then know that when we love, a movement is produced in one direction, and when we hate, in another. But the Why would remain without an answer."

The question of knowing what place in our metaphysical theory we ought to secure for emo-

tion seems difficult to resolve, and we even find some pleasure in leaving it in suspense, in order that it may be understood that a metaphysician is not compelled to explain everything. Besides, the difficulties which stop us here are peculiarly of a psychological order. They proceed from the fact that studies on the nature of the emotions are still very little advanced. The physical conditions of these states are pretty well known, and their psychical and social effects have been abundantly described; but very little is known as to what distinguishes an emotion from a thought.

Two principal opinions may be upheld in the actual state of our acquaintance with the psychology of the feelings. When we endeavour to penetrate their essential and final nature, we have a choice between two contrary theories.

The first and traditional one consists in seeing in emotion a phenomenon *sui generis;* this is very simple, and leaves nothing more to be said.

The second bears the name of the intellectualist theory. It consists in expunging the characteristic of the affective states. We consider them as derivative forms of particular modes of cognition, and they are only "confused intelligence." This intellectualist thesis is of early date; it will be found in Herbart, who, by-the-by, gave it a peculiar form, by causing the play of images to

intervene in the formation of the feelings. However, this particular point is of slight importance. The intellectualist theory is more vast than Herbartism; it exists in all doctrines in which the characteristic difference between thought and feeling is expunged and feeling is brought back to thought. One of the clearest means of so doing consists in only seeing in the feeling the fact of perceiving something. To perceive is, in fact, the property of intelligence; to reason, to imagine, to judge, to understand, is always, in a certain sense, to perceive. It has been imagined that emotion is nothing else than a perception of a certain kind, an intellectual act strictly comparable to the contemplation of a landscape. Only, in the place of a landscape with placid features you must put a storm, a cataclysm of nature; and, instead of supposing this storm outside us, let it burst within us, let it reach us, not by the outer senses of sight and condition, but by the inner senses. What we then perceive will be an emotion.

Such is the theory that two authors—W. James and Lange—happened to discover almost at the same time, Lange treating it as a physiologist and W. James as a philosopher. Their theory, at first sight, appears singular, like everything which runs counter to our mental habits. It lays down that the symptoms which we all till

now have considered as the physiological consequence, the translation, and the distant effects of the emotions, constitute their essential base. These effects are: the expression of the physiognomy, the gesture, the cry, and the speech; or the reflex action on the circulation, the pallor or blushing, the heat mounting to the head, or the cold of the shiver which passes over the body. Or it is the heart, which hastens or slackens its beats, or makes them irregular, or enfeebles, or augments them. Or the respiration, which changes its rhythm, or increases, or is suspended. Or else it is the secretion of the saliva or of the sweat, which flows in abundance or dries up. Or the muscular force, which is increased or decays. Or the almost undefinable organic troubles revealed to us by the singing in the ears, constriction of the epigastrium, the jerks, the trembling, vertigo, or nausea—all this collection of organic troubles which comes more or less confusedly to our consciousness under the form of tactile, muscular, thermal, and other sensations. Until now this category of phenomena has been somewhat neglected, because we saw in it effects and consequences of which the rôle in emotion itself seemed slight, since, if they could have been suppressed, it was supposed that emotion would still remain. The new theory commences by changing the order of events. It

places the physical symptoms of the emotions at the very beginning, and considers them the direct effects of the external excitant, which is expressed by this elegant formula: "It used to be said, 'I perceive a danger; I am frightened, I tremble.' Now we must say, 'I tremble before a danger, first, and it is after having trembled that I am frightened.'" This is not a change in order only; it is something much more serious. The change is directed to the nature of emotion. It is considered to exist in the organic derangements indicated above. These derangements are the basis of emotion, its physical basis, and to be moved is to perceive them. Take away from the consciousness this physical reflex, and emotion ceases. It is no longer anything but an idea.

This theory has at least the merit of originality. It also pleases one by its great clearness—an entirely intellectual clearness, we may say; for it renders emotion comprehensible by enunciating it in terms of cognition. It eliminates all difference which may exist between a perception and an emotion. Emotion is no longer anything but a certain kind of perception, the perception of the organic sensations.

This reduction, if admitted, would much facilitate the introduction of emotion into our system, which, being founded on the distinction between the consciousness and the object, is likewise an

intellectualist system. The definition of emotion, as it is taught by W. James, seems expressly made for us who are seeking to resolve all intellectual states into physical impressions accompanied by consciousness.

By the side of emotion we may place, as demanding the same analytical study, the feeling of effort. We ought to inquire with effort, as has been done with emotion, what is the psychological nature of this phenomenon; and in the same way that there exists an intellectualist theory of the emotions, viz. that of James, who reduces all the history of the emotions to intelligence, so there exists an intellectualist theory of effort, which likewise tends to bring back all will to intelligence. It is again the same author, that true genius, W. James, who has attempted this reduction. I do not know whether he has taken into account the parallelism of the two theories, but it is nevertheless evident. Effort, that basis of activity, that state of consciousness which so many psychologists have described as something *sui generis*, becomes to James a phenomenon of perception. It is the perception of sensations proceeding from the muscles, the tendons, the articulations, the skin, and from all the organs directly or indirectly concerned in the execution of movement. To be conscious of an effort would then be nothing else than to receive all these

centripetal sensations; and what proves this is, that the consciousness of effort when most clearly manifested is accompanied by some muscular energy, some strong contraction, or some respiratory trouble, and yields if we render the respiration again regular and put the muscles back into repose.

To my great regret I can state nothing very clear regarding these problems. The attempt to intellectualise all psychical problems is infinitely interesting, and leads to a fairly clear conception, by which everything is explained by a mechanism reflected in a mirror, which is the consciousness. But we remain perplexed, and we ask ourselves whether this clearness of perception is not somewhat artificial, whether affectivity, emotivity, tendency, will, are really all reduced to perceptions, or whether they are not rather irreducible elements which should be added to the consciousness. Does not, for instance, desire represent a complement of the consciousness? Do not desire and consciousness together represent a something which does not belong to the physical domain and which forms the moral world? This question I leave unanswered.

CHAPTER V

DEFINITION OF THE CONSCIOUSNESS—THE RELATION SUBJECT-OBJECT

AFTER having separated from the consciousness that which it is not, let us try to define what it is. This and the two following chapters are devoted to this study.

A theory has often been maintained with regard to the consciousness; namely, that it supposes a relation between two terms—a subject and an object, and that it consists exactly in the feeling of this relation. By subject is understood the something that has consciousness; the object is the something of which we are conscious. Every thought, we are told, implies subject and object, the representer and the represented, the *sentiens* and the *sensum*—the one active, the other passive, the active acting on the passive, the *ego* opposed to the *non ego*.

This opinion is almost legitimised by current language. When speaking of our states of consciousness, we generally say, "I am conscious; it is I who have consciousness," and we attribute

to our I, to our Ego, to our personality, the rôle of subject. But this is not a peremptory argument in favour of the above opinion; it is only a presumption, and, closely examined, this presumption seems very weak.

Hitherto, when analysing the part of mind, we have employed non-committal terms: we have said that sensation implied consciousness, and not that sensation implied something which is conscious.[1] The difference may appear too subtle, but it is not; it consists in taking from consciousness the notion of a subject being conscious and replacing it by the very act of consciousness.

My description applies very exactly, I think, to the facts. When we are engaged in a sensation, or when we perceive something, a phenomenon occurs which simply consists in having consciousness of a thing. If to this we add the idea of the subject which has consciousness, we distort the event. At the very moment when it is taking place, it is not so complicated; we complicate it by adding to it the work of reflection. It is

[1] This second method of expression, which I consider inexact, is constantly found in DESCARTES. Different philosophers have explicitly admitted that every act of cognition implies a relation subject-object. This is one of the corner-stones of the neo-criticism of RENOUVIER. He asserts that all representation is double-faced, and that what is known to us presents itself in the character of both representative and represented. He follows this up by describing separately the phenomena and laws of the representative and of the represented respectively.

reflection which constructs the notion of the subject, and it is this which afterwards introduces this construction into the states of consciousness; in this way the state of consciousness, by receiving this notion of subject, acquires a character of duality it did not previously possess. There are, in short, two separate acts of consciousness, and one is made the subject of the other. "Primitively," says Rabier, "there is neither representative nor represented; there are sensations, representations, facts of consciousness, and that is all. Nothing is more exact, in my opinion, than this view of Condillac's:—that primitively, the inanimate statue is entirely the sensation that it feels. To itself it is all odour and all savour; it is nothing more, and this sensation includes no duality for the consciousness. It is of an absolute simplicity."

Two arguments may be advanced in favour of this opinion. The first is one of logic. We have divided all knowledge into two groups—objects of cognition, and acts of cognition. What is the subject of cognition? Does it form a new group? By no means; it forms part of the first group, of the object group; for it is something to be known.

Our second argument is one of fact. It consists in remembering that which in practice we understand by the subject of cognition; or rather, meta-

phorically we represent this subject to ourselves as an organ—the eye that sees or the hand that touches—and we represent to ourselves the relation subject-object in the shape of a material relation between two distinct bodies which are separated by an interval and between which some action is produced which unites them. Or else, confusing the subject and the Ego, which are nevertheless two different notions, we place the Ego in the consciousness of the muscular effort struggling against something which resists. Or, finally and still more frequently, we represent the subject to ourselves by confusing it with our own personality; it is a part of our biography, our name, our profession, our social status, our body, our past life foreshortened, our character, or, in a word, our civil personality, which becomes the subject of the relation subject-object. We artificially endow this personality with the faculty of having consciousness; and it results from this that the entity consciousness, so difficult to define and to imagine, profits by all this factitious addition and becomes a person, visible and even very large, in flesh and bone, distinct from the object of cognition, and capable of living a separate life.

It is not difficult to explain that all this clearness in the representation of ideas is acquired by a falsification of the facts. So

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sensorial a representation of consciousness is very unfaithful; for our biography does not represent what we have called acts of consciousness, but a large slice of our past experience—that is to say, a synthesis of bygone sensations and images, a synthesis of objects of consciousness; therefore a complete confusion between the acts of consciousness and their objects. The formation of the personality seems to me to have, above all, a legal and social importance.[1] It is a peculiar grouping of states of consciousness imposed by our relations with other individuals. But, metaphysically, the subject thus understood is not distinguished from the object, and there is nothing to add to our distinction between the object and the act of consciousness.

Those who defend the existence of the subject point out that this subject properly constitutes the Ego, and that the distinction of the subject and the object corresponds to the distinction of the Ego and non-Ego, and furnishes the separa-

[1] The preceding ten lines in the text I wrote after reading a recent article of WILLIAM JAMES, who wishes to show that the consciousness does not exist, but results simply from the relation or the opposition raised between one part of our experience (the actual experience, for instance, in the example of the perception of an object) and another part, the remembrance of our person. But the argument of JAMES goes too far; he is right in contesting the relation subject-object, but not in contesting the existence of the consciousness (W. JAMES: "Does consciousness exist?" in *J. of Philosophy, &c.*, Sept. 1904).

tion between the physical and the moral so long sought.

It is evidently very enticing to make of the Ego thus a primitive notion of the consciousness; but this view of the Ego as opposed to the non-Ego in no way corresponds to that of the mental and the physical. The notion of the Ego is much larger, much more extensible, than that of the mental; it is as encroaching as human pride, it grasps in its conquering talons all that belongs to us; for we do not, in life, make any great difference between what is *we* and what is *ours*—an insult to our dog, our dwelling, or our work wounds us as much as an insult to ourselves. The possessive pronoun expresses both possession and possessor. In fact, we consider our body as being ourselves.

Here, then, are numbers of material things introducing themselves into the category of mental things. If we wished to expel them and to reduce the domain of the Ego to the domain of the mental, we could only do so if we already possessed the criterion of what is essentially mental. The notion of the Ego cannot therefore supply us with this criterion.

Another opinion consists in making of the subject a spiritual substance, of which the consciousness becomes a faculty. By substance is understood an entity which possesses the two following princi-

pal characteristics, unity and identity, this latter merging into unity, for it is nothing else but the persistence of unity through the course of time. Certain philosophers have asserted that through intuition we can all establish that we are a spiritual substance. I am compelled to reject this idea, because I think the expression *spiritual substance* has no meaning; nothing but the sonorous value of six syllables. It has also been supposed, that there exists a corporeal substance hidden under the sensations, in which are implanted the qualities of bodies, as the various organs of a flower are in its calyx. I will return later to this conception of a material substance. That of a spiritual substance cannot be defended, and the chief and fatal argument I urge against it is, that we cannot represent it to our minds, we cannot think it, and we cannot see in these words "spiritual substance" any intelligible idea; for that which is mental is limited to "that which is of the consciousness." So soon as we endeavour to go beyond the fact of having consciousness to imagine a particular state which must be mental, one of two things happen; either we only grasp the void, or else we construct a material and persistent object in which we recognise psychical attributes. These are two conclusions which ought to be rejected.

CHAPTER VI

DEFINITION OF THE CONSCIOUSNESS—CATEGORIES OF THE UNDERSTANDING

It has often been said that the rôle of intelligence consists in uniting or grasping the relations of things. An important question, therefore, to put, is, if we know whereof these relations consist, and what is the rôle of the mind in the establishment of a relation?

It now and then happens to us to perceive an isolated object, without comparing it with any other, or endeavouring to find out whether it differs from or resembles another, or presents with any other a relation of cause to effect, or of sign to thing signified, or of co-existence in time and space. Thus, I may see a red colour, and occupy all the intellect at my disposal in the perception of this colour, seeing nothing but it, and thinking of nothing but it. Theoretically, this is not impossible to conceive, and, practically, I ask myself if these isolated and solitary acts of consciousness do not sometimes occur.

It certainly seems to me that I have noticed in myself moments of intellectual tonelessness,

when in the country, during the vacation, I look at the ground, or the grass, without thinking of anything—or at least, of anything but what I am looking at, and without comparing my sensation with anything. I do not think we should admit in principle, as do many philosophers, that "we take no cognisance save of relations." This is the *principle of relativity*, to which so much attention has been given. Taken in this narrow sense, it seems to me in no way imperative for our thoughts. We admit that it is very often applied, but without feeling obliged to admit that it is of perpetual and necessary application.

These reserves once made, it remains to remark, that the objects we perceive very rarely present themselves in a state of perfect isolation. On the contrary, they are brought near to other objects by manifold relations of resemblance, of difference, or of connection in time or space; and, further, they are compared with the ideas which define them best. We do not have consciousness of an object, but of the relations existing between several objects. Relation is the new state produced by the fact that one perceives a plurality of objects, and perceives them in a group.

Show me two colours in juxtaposition, and I do not see two colours only, but, in addition, their resemblance in colour or value. Show me

two lines, and I do not see only their respective lengths but their difference in length. Show me two points marked on a white sheet of paper, and I do not see only the colour, form, and dimension of the points, but their distance from each other. In our perceptions, as in our conceptions, we have perpetually to do with the relations between things. The more we reflect, the more we understand things, the more clearly we see their relations; the multiplication of relations is the measure of the depth of cognition.[1]

The nature of these relations is more difficult to ascertain than that of objects. It seems to be more subtle. When two sounds make themselves heard in succession, there is less difficulty in making the nature of these two sounds understood than the nature of the fact that one occurs before the other. It would appear that, in the perception of objects, our mind is passive and reduced to the state of reception, working like a registering machine or a sensitive surface, while in the perception of relations it assumes a more important part.

Two principal theories have been advanced, of which one puts the relations in the things per-

[1] At the risk of being deemed too subtle, I ask whether we are conscious of a relation between objects, or whether that which occurs is not rather the perception of an object which has been modified in its nature by its relation with another object.

ceived, and the other makes them a work of the mind. Let us begin with this last opinion. It consists in supposing that the relations are given to things by the mind itself. These relations have been termed categories. The question of categories plays an important part in the history of philosophy. Three great philosophers, Aristotle, Kant, and Renouvier have drawn up a list, or, as it is called, a table of them, and this table is very long. To give a slight idea of it, I will quote a few examples, such as time, space, being, resemblance, difference, causality, becoming, finality, &c.

By making the categories the peculiar possession of the mind, we attribute to these cognitions the essential characteristic of being anterior to sensation, or, as it is also termed, of existing *a priori:* we are taught that not only are they not derived from experience, nor taught us by observation, but further that they are presupposed by all observation, for they set up, in scholastic jargon, the conditions which make experience possible. They represent the personal contribution of the mind to the knowledge of nature, and, consequently, to admit them is to admit that the mind is not, in the presence of the world, reduced to the passive state of a *tabula rasa,* and that the faculties of the mind are not a transformation of sensation. Only these categories do not supplement sensation, they

do not obviate it, nor allow it to be conjectured beforehand. They remain empty forms so long as they are not applied to experience; they are the rules of cognition and not the objects of cognition, the means of knowing and not the things known; they render knowledge possible, but do not of themselves constitute it. Experience through the senses still remains a necessary condition to the knowledge of the external world. It may be said that the senses give the matter of knowledge, and that the categories of the understanding give the form of it. Matter cannot exist without form, nor form without matter; it is the union of the two which produces cognition.

Such is the simplest idea that can be given of the Kantian theory of categories, or, if it is preferred to employ the term often used and much discussed, such is the theory of the Kantian idealism. This theory, I will say frankly, hardly harmonises with the ideas I have set forth up to this point. To begin with, let us scrutinise the relation which can exist between the subject and the object. We have seen that the existence of the subject is hardly admissible, for it could only be an object in disguise. Cognition is composed in reality of an object and an act of consciousness. Now, how can we know if this act of consciousness, by adding itself to the object, modifies it and causes it to appear other than it is?

This appears to me an insoluble question, and probably, even, a factitious one. The idea that an object can be modified in its nature or in its aspect comes to us through the perception of bodies. We see that, by attacking a metal with acids, this metal is modified, and that by heating a body its colour and form become changed; or that by electrifying a thread it acquires new properties; or that when we place glasses before our eyes we change the visible aspect of objects; or that, if we have inflammation of the eyelids, light is painful, and so on. All these familiar experiments represent to us the varied changes that a body perceived can undergo; but it must be carefully remarked that in cases of this kind the alteration in the body is produced by the action of a second body, that the effect is due to an intercourse between two objects. On the contrary, when we take the Kantian hypothesis, that the consciousness modifies that which it perceives, we are attributing to the consciousness an action which has been observed in the case of the objects, and are thus transporting into one domain that which belongs to a different one; and we are falling into the very common error which consists in losing sight of the proper nature of the consciousness and making out of it an object.

If we set aside this incorrect assimilation, there no longer remains any reason for refusing to

admit that we perceive things as they are, and that the consciousness, by adding itself to objects, does not modify them.

Phenomena and appearances do not, then, strictly speaking, exist. Till proof to the contrary, we shall admit that everything we perceive is real, that we perceive things always as they are, or, in other words, that we always perceive *noumena*.[1]

[1] This conclusion may seem contradictory to that which I enunciated when studying the constitution of matter. I then asserted that we only know our sensations and not the excitants which produce them. But these sensations are matter; they are matter modified by other matter, viz. our nervous centres.

We therefore take up very distinctly an opposite standpoint to the principle of *relativity*: in other terms, we reject the phenomenism of Berkeley.

When we go into metaphysics we are continually astounded to see how different conceptions of things which have a classic value are independent of each other. In general, phenomenism is opposed to substantialism, and it is supposed that those who do not accept the former doctrine must accept the latter, while, on the contrary, those who reject substantialism must be phenomenists. We know that it is in this manner that Berkeley conquered corporeal substantialism and taught phenomenism; while Hume, more radical than he, went so far as to question the substantialism of mind. On reflection, it seems to me that, after having rejected phenomenism, we are in no way constrained to accept substance. By saying that we perceive things as they are, and not through a deluding veil, we do not force ourselves to acknowledge that we perceive the substance of bodies—that is to say, that something which should be hidden beneath its qualities and should be distinct from it. The distinction between the body and its qualities is a thing useful in practice, but it answers to no perception or observation. The body is only a group, a sheaf of qualities. If the qualities seem unable to exist

After having examined the relations of the consciousness with its objects, let us see what concerns the perception, by the consciousness, of the relations existing between these objects themselves. The question is to ascertain whether the *a priorists* are right in admitting that the establishment of these relations is the work of the consciousness. The rôle of synthetic power that is thus attributed to consciousness is difficult to conceive unless we alter the definition of consciousness to fit the case. In accordance with the definition we have given and the idea we have of

of themselves and to require a subject, this is only a grammatical difficulty, which is due to the fact that, while calling certain sensations qualities, we suppose a subject to be necessary. On the other hand, the representation which we make to ourselves of a material substance and its rôle as the support of the qualities, is a very naïve and mechanical representation, thanks to which certain sensations become the supports of other and less important sensations. It would suffice to insist on the detail of this representation and on its origin to show its artificial character. The notion we have of the stability of bodies and of the persistence of their identity, notwithstanding certain superficial changes, is the reason for which I thought proper to attribute a substance to them, that is to say, an invariable element. But we can attain the same end without this useless hypothesis; we have only to remark that the identity of the object lies in the aggregate of its properties, including the name it bears. If the majority of its properties, especially of those most important to us, subsists without alteration, or if this alteration, though of very great extent, takes place insensibly and by slow degrees, we decide that the object remains the same. We have no need for that purpose to give it a substance one and indestructible. Thus we are neither adherents of phenomenism, nor of substantialism.

it, the consciousness makes us acquainted with what a thing is, but it adds nothing to it. It is not a power which begets objects, nor is it a power which begets relations.

Let us carefully note the consequence at which we should arrive, if, while admitting, on the one hand, that our consciousness lights up and reveals the objects without creating them, we were, on the other hand, to admit that it makes up for this passivity by creating relations between objects. We dare not go so far as to say that this creation of relations is arbitrary and corresponds in no way to reality; or that, when we judge two neighbouring or similar objects, the relations of contiguity and resemblance are pure inventions of our consciousness, and that these objects are really neither contiguous nor similar.

It must therefore be supposed that the relation is already, in some manner, attracted into the objects; it must be admitted that our intelligence does not apply its categories haphazard or from the caprice of the moment; and it must be admitted that it is led to apply them because it has perceived in the objects themselves a sign and a reason which are an invitation to this application, and its justification. On this hypothesis, therefore, contiguity and resemblance must exist in the things themselves, and must be perceived; for without this we should run the

risk of finding similar that which is different, and contiguous that which has no relation of time or space. Whence it results, evidently, that our consciousness cannot create the connection completely, and then we are greatly tempted to conclude that it only possesses the faculty of perceiving it when it exists in the objects.[1]

According to this conception, the rôle of the consciousness in the perception of a connection is that of a witness, as in the perception of objects. The consciousness does not create, but it verifies. Resemblance is a physical property of objects, like colour; and contiguity is a physical property of objects, like form. The connections between the objects form part of the group object and not of the group consciousness, and they are just as independent of consciousness as are the objects themselves.

Against this conclusion we must anticipate several objections. One of them will probably consist in accentuating the difference existing between the object and the connection from the dynamical point of view. That the object may be passively contemplated by the consciousness can be understood, it will be said; but the relation is not only an object of perception—it is, further,

[1] I borrow from RABIER this argument, which has thoroughly convinced me (see *Psychologie*, p. 281).

a principle of action, a power of suggestion, and an agent of change.

It might, then, be supposed that the consciousness here finds a compensation for the rôle that has been withdrawn from it. If it is not the thing that creates the relation, it will be said, at least it is that which creates its efficacity of suggestion. Many psychologists have supposed that a relation has the power of evocation only when it has been perceived. The perception of resemblance precedes the action of resemblance. It is consequently the consciousness which assembles the ideas and gives them birth by perceiving their relations.

This error, for it is one, has long been widespread—indeed, it still persists.[1] We have, however, no difficulty in understanding that the perception of a resemblance between two terms supposes them to be known; so long as only one of the terms is present to the consciousness, this perception does not exist; it cannot therefore possess the property of bringing to light the second term. Suggestion is therefore distinct from recognition; it is when suggestion has acted, when the resemblance in fact has brought the two

[1] PILON is the psychologist who has the most forcibly demonstrated that resemblance acts before being perceived. I refer the readers to my *Psychologie du Raisonnement*, where I have set forth this little problem in detail.

terms together, that the consciousness, taking cognisance of the work accomplished, verifies the existence of a resemblance, and that this resemblance explains the suggestion.

Second objection: we are told that the relations between the objects—that is, the principal categories—must be of a mental nature, because they are *a priori*. That they are *a priori* means that they are at once anterior and superior to the experience. Let us see what this argument is worth.

It appears that it is somewhat misused. With regard to many of the categories, we are content to lay down the necessity of an abstract idea in order to explain the comprehension of a concrete one. It is said, for example: how can it be perceived that two sensations are successive, if we do not already possess the idea of time? The argument is not very convincing, because, for every kind of concrete perception it is possible to establish an abstract category.

It might be said of colour that it is impossible to perceive it unless it is known beforehand what colour is; and so on for a heap of other things. A more serious argument consists in saying that relations are *a priori* because they have a character of universality and of necessity which is not explained by experience, this last being always contingent and peculiar. But it is not necessary

that a function should be mental for it to be *a priori*. The identification of the *a priori* with the mental is entirely gratuitous. We should here draw a distinction between the two senses of the *a priori*: anteriority and superiority.

A simple physical mechanism may be *a priori*, in the sense of anteriority. A house is *a priori*, in regard to the lodgers it receives; this book is *a priori*, in regard to its future readers. There is no difficulty in imagining the structure of our nervous system to be *a priori*, in regard to the excitements which are propagated in it. A nerve cell is formed, with its protoplasm, its nucleus and its nucleoli before being irritated; its properties precede its functions. If it be possible to admit that as a consequence of ancestral experiences the function has created the organ, the latter is now formed, and this it is which in its turn becomes anterior to the function. The notion of *a priori* has therefore nothing in it which is repugnant to physical nature.

Let us now take the *a priori* in the sense of superiority. Certain judgments of ours are, we are told, universal and necessary, and through this double character go beyond the evidence of experience. This is an exact fact which deserves to be explained, but it is not indispensable to explain it by allowing to the consciousness a source of special cognitions. The English school of philo-

sophy have already attacked this problem in connection with the origin of axioms. The principle of their explanation lies in the virtue of what they have termed "inseparable association." They have supposed that when an association is often repeated it creates a habit of thought against which no further strife is possible. The mechanism of association itself should then add a special virtue to the contingency of facts. A hundred repetitions of related facts, for example, would give rise to so firm an association, that no further repetition would increase it.

I consider this explanation a very sound one in principle. It is right to put into association something more than into experience. I would only suggest a slight correction in detail. It is not the association forged by repetition which has this virtue of conveying the idea of necessity and universality, it is simply the uncontradicted association. It has been objected, in fact, and with reason, to the solution of Mill, that it insists on a long duration of experience, while axioms appear to be of an irresistible and universal truthfulness the moment they are conceived. And this is quite just. I should prefer to lay down as a law that every representation appears true, and that every link appears necessary and universal as soon as it is formed. This is its character from the first. It preserves it so long

as no contradiction in fact, in reasoning, or in idea, comes to destroy it.[1]

What seems to stand out most clearly after all these explanations is the rôle which we ought to attribute to the consciousness. Two rival theories have been maintained: that of the mirror-consciousness and that of the focus-consciousness. It would seem—I merely say it would seem—that the first of these best harmonises with the preceding facts. For what seems most probable is, that the consciousness illuminates and reveals but does not act. The theory of the focus-consciousness adapts itself less to the mechanism of the association of ideas.

From this we come quite naturally to see in the intelligence only an inactive consciousness; at one moment it apprehends an object, and it is a perception or an idea; at another time it perceives a connection, and it is a judgment; at yet another, it perceives connections between connections, and it is an act of reason. But however subtle the object it contemplates may become, it does not depart from its contemplative attitude, and cognition is but a consciousness.

One step further, and we should get so far as to

[1] We think spontaneously of the general and the necessary. It is this which serves as a basis for the suggestion and the catchword (*réclame*), and it explains how minds of slender culture always tend towards absolute assertions and hasty generalisations.

admit that the consciousness serves no purpose whatever, and that it is a useless luxury, since, if all efficacious virtue is to be found in the sensations and the ideas which we consider as material facts, the consciousness which reveals them adds nothing to, takes nothing from, and modifies nothing in them; and everything would go on the same, nor would anything in this world be changed, if one day the light of consciousness were, by chance, to be put out. We might imagine a collection of automatons forming a human society as complicated as, and not different in appearance from, that of conscious beings; these automatons would make the same gestures, utter the same words as ourselves, would dispute, complain, cry, and make love like us; we might even imagine them capable, like us, of psychology. This is the thesis of the epiphenomenal consciousness which Huxley has boldly carried to its uttermost conclusions.

I indicate here these possible conclusions, without discussing them. It is a question I prefer to leave in suspense; it seems to me that one can do nothing on this subject but form hypotheses.

CHAPTER VII

DEFINITION OF THE CONSCIOUSNESS—THE SEPARABILITY OF THE CONSCIOUSNESS FROM ITS OBJECT—DISCUSSION OF IDEALISM

One last question suggests itself with regard to the consciousness. In what measure is it separable from the object? Do the consciousness and its object form two things or only one?

Under observation these two terms constantly show themselves united. We experience a sensation and have consciousness of it; it is the same fact expressed in two different ways. All facts of our perception thus present themselves, and they are one. But our reason may outstrip our observation. We are able to make a distinction between the two elements *being* and *being perceived*. This is not an experimental but an ideological distinction, and an abstraction that language makes easy.

Can we go further, and suppose one of the parts thus analysed capable of existing without the other? Can sensation exist as physical expression, as an object, without being illuminated by the consciousness? Can the consciousness exist without having an object?

Let us first speak of the existence of the object when considered as separated from the consciousness. The problem is highly complicated.

It has sometimes been connected with the idealist thesis according to which the object of consciousness, being itself a modality of the consciousness, cannot exist apart from it—that is to say, outside the periods in which it is perceived. It would therefore result from this that this separation between existence and perception might be made, when it is admitted (contrary to the idealist hypothesis) that the object perceived is material and the consciousness which perceives it mental. In this case, it will be thought, there is no link of solidarity between the consciousness and its continuity. But I am not of that opinion. The union of the consciousness and its object is one of fact, which presents itself outside any hypothesis on the nature of the object. It is observation which demonstrates to us that we must perceive an object to be assured of its existence; the reason, moreover, confirms the necessity of this condition, which remains true whatever may be the "stuff" of the object.

Having stated this, the question is simply to know whether this observation of fact should be generalised or not. We may, it seems to me, decline to generalise it without falling into a

contradiction in terms. It may be conceived that the objects which we are looking at continue to exist, without change, during the moments when we have lost sight of them. This seems reasonable enough, and is the opinion of "common" sense.[1]

The English philosophers, Bain and Mill, have combated this proposition with extraordinary ardour, like believers combating a heresy. But notwithstanding their attacks it remains intelligible, and the distinction between *being* and *being perceived* preserves its logical legitimacy. This may be represented, or may be thought; but can it be realised?

So far as regards external objects, I think we all, in fact, admit it. We all admit a distinction between the existence of the outer world and the perception we have of it; its existence is one thing, and our perception of it is another. The existence of the world continues without interruption; our perception is continually interrupted by the most fortuitous causes, such as change of position, or even the blinking of the eyes; its existence is general, universal, independent of time and space; our perception is partial, particular, local, limited by the horizon of our senses, determined by the geographical position of our bodies, riddled by the distractions of our intelligence, deceived by the illusions of our minds,

[1] That is to say, the sense of the multitude.—ED.

and above all diminished by the infirmity of our intelligence, which is able to comprehend so little of what it perceives. This is what we all admit in practice; the smallest of our acts implies the belief in something perceptible which is wider and more durable than our astonished perceptions. I could not write these lines unless I implicitly supposed that my inkstand, my paper, my pen, my room, and the surrounding world subsist when I do not see them. It is a postulate of practical life. It is also a postulate of science, which requires for its explanations of phenomena the supposition in them of an indwelling continuity. Natural science would become unintelligible if we were forced to suppose that with every eclipse of our perceptions material actions were suspended. There would be beginnings without sequences, and ends without beginnings.

Let us note also that acquired notions on the working of our nervous system allow us to give this postulate a most precise form: the external object is distinct from the nervous system and from the phenomena of perception which are produced when the nervous system is excited; it is therefore very easy to understand that this object continues to exist and to develop its properties, even when no brain vibrates in its neighbourhood.

Might we not, with the view of strengthening

this conclusion as to the continuous existence of things, dispense with this postulate, which seems to have the character of a grace, of an alms granted to us? Might not this continuous existence of objects during the eclipses of our acts of consciousness, be demonstrated? It does not seem to me impossible. Let us suppose for a moment the correctness of the idealist thesis: all our legitimate knowledge of objects is contained within the narrow limits of actual sensation; then, we may ask, of what use is the reason? What is the use of the memory? These functions have precisely for their object the enlarging of the sphere of our sensations, which is limited in two principal ways, by time and by space. Thanks to the reason, we manage to see in some way that which our senses are unable to perceive, either because it is too distant from us, or because there are obstacles between us and the object, or because it is a past event or an event which has not yet taken place which is in question.

That the reason may be deceived is agreed. But will it be asserted that it is always deceived? Shall we go so far as to believe that this is an illegitimate mode of cognition? The idealist thesis, if consistent, cannot refuse to extend itself to this extreme conclusion; for a reasoned conclusion contains, when it has a meaning, a certain assertion on the order of nature, and this

assertion is not a perception, since its precise object is to fill up the gaps in our perceptions. Not being a perception, it must be rejected, if one is an idealist.

The idealist will therefore keep strictly to the perception of the moment, and this is so small a thing when deprived of all the conjectures which enrich it, that the world, if reduced to this alone, would be but the skeleton of a world. There would then be no more science, no possibility of knowledge. But who could make up his mind thus to shut himself up in perception?

I suppose, indeed, that there will here be quibbling. This objection will be made: that in the hypothesis of a discontinuous existence of things, reason may continue to do its work, provided the intervention of a possible perception be supposed. Thus, I notice this morning, on going into my garden, that the pond which was dry yesterday is full of water. I conclude from this, "It has rained in the night." To be consistent with idealism, one must simply add: "If some one had been in the garden last night, he would have seen it rain." In this manner one must re-establish every time the rights of perception.

Be it so. But let us notice that this addition has no more importance than a prescribed formula in a notarial act; for instance, the presence of a second notary prescribed by the law, but always

dispensed with in practice. This prescribed formula can always be imagined or even understood. We shall be in accord with idealism by the use of this easy little formula, "If some one had been there," or even by saying, "For a universal consciousness. . . ." The difference of the realist and idealist theory becomes then purely verbal. This amounts to saying that it disappears. But there is always much verbalism in idealism.

One more objection: if this witness—the consciousness—suffices to give objects a continuity of existence, we may content ourselves with a less important witness. Why a man? The eyes of a mollusc would suffice, or those of infusoria, or even of a particle of protoplasm: living matter would become a condition of the existence of dead matter. This, we must acknowledge, is a singular condition, and this conclusion condemns the doctrine.

CHAPTER VIII

DEFINITION OF THE CONSCIOUSNESS—THE SEPARATION OF THE CONSCIOUSNESS FROM ITS OBJECT —THE UNCONSCIOUS

I ASK myself whether it is possible, by going further along this road of the separation between the consciousness and its object, to admit that ideas may subsist during the periods when we are not conscious of them. It is the problem of unconsciousness that I am here stating.

One of the most simple processes of reasoning consists in treating ideas in the same manner as we have treated the external objects. We have admitted that the consciousness is a thing superadded to the external objects, like the light which lights up a landscape, but does not constitute it and may be extinguished without destroying it. We continue the same interpretation by saying that ideas prolong their existence while they are not being thought, in the same way and for the same motive that material bodies continue theirs while they are not being perceived. All that it seems permissible to say is that this conception is not unrealisable.

Let us now place ourselves at the point of view of the consciousness. We have supposed up to the present the suppression of the consciousness, and have seen that we can still imagine the object continuing to exist. Is the converse possible? Let us suppose that the object is suppressed. Can the consciousness then continue to exist? On this last point it seems that doubt is not possible, and we must answer in the negative. A consciousness without an object, an empty consciousness, in consequence, cannot be conceived; it would be a zero—a pure nothingness; it could not manifest itself. We might admit, in strictness, that such a consciousness might exist virtually as a power which is not exercised, a reserve, a potentiality, or a possibility of being; but we cannot comprehend that this power can realise or actualise itself. There is therefore no actual consciousness without an object.

The problem we have just raised, that of the separability of the elements which compose an act of consciousness, is continued by another problem—that of unconsciousness. It is almost the same problem, for to ask one's self what becomes of a known thing when we separate from it the consciousness which at first accompanied it, is to ask one's self in what an unconscious phenomenon consists.

We have, till now, considered the two principal

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sciousness is a magnitude capable of increase and decrease, like sensation itself. According to the individual, consciousness may have a very large or a very small field, and may embrace at the same time a variable number of objects. I can pay attention to several things at the same time, but when I am tired it becomes more difficult to me. I lose in extension, or, as is still said, the field of consciousness is restricted. It may also lose not only in extent of surface, but in depth. We have all of us observed in our own selves moments of obscure consciousness when we understand dimly, and moments of luminous consciousness which carry one almost to the very bottom of things. It is difficult to consider those in the wrong who admit, with Leibnitz, the existence of small states of consciousness. The lessening of the consciousness is already our means of understanding the unconscious; unconsciousness is the limit of this reduction.[1]

This singular fact has also been noticed, that, in the same individual there may co-exist several kinds of consciousness which do not enter into communication with each other and which are not acquainted with each other. There is a principal consciousness which speaks, and, in addition,

[1] I think I have come across in ARISTOTLE the ingenious idea that the enfeeblement of the consciousness and its disorder may be due to the enfeeblement and disorder of the object. It is a theory which is by no means improbable.

accessory kinds of consciousness which do not speak, but reveal their existence by the use of other modes of expression, of which the most frequent is writing.

This doubling or fractionation of the consciousness and personality have often been described in the case of hysterical subjects. They sometimes occur quite spontaneously, but mostly they require a little suggestion and cultivation. In any case, that they are produced in one way or other proves that they are possible, and, for the theory, this possibility is essential. Facts of this kind do not lead to a theory of the unconscious, but they enable us to understand how certain phenomena, unconscious in appearance, are conscious to themselves, because they belong to states of consciousness which have been separated from each other.

A third thesis, more difficult of comprehension than the other two, supposes that the consciousness may be preserved in an unconscious form. This is difficult to admit, because unconsciousness is the negation of consciousness. It is like saying that light can be preserved when darkness is produced, or that an object still exists when, by the hypothesis, it has been radically destroyed. This idea conveys no intelligible meaning, and there is no need to dwell on it.

We have not yet exhausted all the concepts whereby we may get to unconsciousness. Here is

another, the last I shall quote, without, however, claiming that it is the last which exists. We might call it the physiological concept, for it is the one which the physiologists employ for choice. It is based upon the observation of the phenomena which are produced in the nervous system during our acts of consciousness; these phenomena precede consciousness as a rule, and condition it. According to a convenient figure which has been long in use, the relations of the physiological phenomenon to the consciousness are represented as follows: the physiological phenomenon consists in an excitement which, at one time, follows a direct and short route from the door by which it enters the nervous system to the door by which it makes its exit. In this case, it works like a simple mechanical phenomenon; but sometimes it makes a longer journey, and takes a circuitous road by which it passes into the higher nerve centres, and it is at the moment when it takes this circuitous road that the phenomenon of consciousness is produced. The use of this figure does not prejudge any important question.

Going further, many contemporary authors do not content themselves with the proposition that the consciousness is conditioned by the nervous phenomenon, but suggest also that it is continually accompanied by it. Every psychical

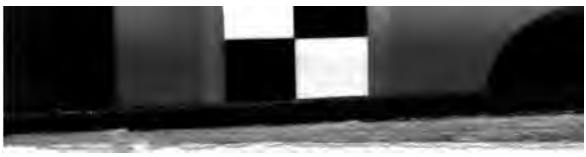
fact of perception, of emotion, or of idea should have, it is supposed, a physiological basis. It would therefore be, taken in its entirety, psycho-physiological. This is called the parallelist theory.

We cannot discuss this here, as we shall meet with it again in the third part of this book. It has the advantage of leading to a very simple definition of unconsciousness. The unconscious is that which is purely physiological. We represent to ourselves the mechanical part of the total phenomenon continuing to produce itself, in the absence of the consciousness, as if this last continued to follow and illuminate it.

Such are the principal conceptions that may be formed of the unconscious. They are probably not the only ones, and our list is not exhaustive.

After having indicated what the unconscious is, we will terminate by pointing out what it is not and what it cannot be.

We think, or at least we have impliedly supposed in the preceding definitions, that the unconscious is only something unknown, which may have been known, or which might become known under certain conditions, and which only differs from the known by the one characteristic of not being actually known. If this notion be correct, one has really not the right to arm this unconsciousness with formidable powers. It has the power of the reality to which it corresponds, but its



character of unconsciousness adds nothing to this. It is the same with it as with the science of the future. No scholar will hesitate to admit that that science will be deeper and more refined than that already formed. But it is not from the fact that it is unknown that it will deserve its superiority: it is from the phenomena that it will embrace. To give to that which is unconscious, as we here understand it, an overwhelming superiority over the conscious as such, we must admit that the consciousness is not only a useless luxury, but the dethronement of the forces that it accompanies.

In the next place, I decline to admit that the consciousness itself can become unconscious, and yet continue in some way under an unconscious form. This would be, in my opinion, bringing together two conceptions which contradict each other, and thus denying after having affirmed. From the moment that the consciousness dies, there remains nothing of it, unless it be the conditions of its appearance, conditions which are distinct from itself. Between two moments of consciousness separated by time or by a state of unconsciousness, there does not and cannot exist any link. I feel incapable of imagining of what this link could be composed, unless it were material—that is to say, unless it were supplied from the class of objects. I have already said that the sub-

stantialist thesis endeavours to establish a continuity between one consciousness and another separated by time, by supposing a something durable, of which the consciousness would be a property of intermittent manifestation. They would thus explain the interruptions of consciousness as the interruptions in the light of a lamp. When the light is extinguished, the lamp remains in darkness, but is still capable of being lighted. Let us discard this metaphor, which may lead to illusion. The concept of consciousness can furnish no link and no mental state which remains when the consciousness is not made real; if this link exists, it is in the permanence of the material objects and of the nervous organism which allows the return of analogous conditions of matter.

CHAPTER IX

DEFINITIONS OF PSYCHOLOGY

LET us resume the study of the preceding ideas in another form. Since, moreover, to define mind is at the same time to define psychology, let us seek for the truth which we can glean from the definitions of this science. Our object is not to discover an exact definition, but to make use of those already existing.

To define psychology is to describe the features of the domain over which this science holds sway, and at the same time to indicate the boundaries which separate it from its neighbours. At first sight this is an affair of geometric survey, presenting no kind of difficulty; for psychology does not merge by insensible transitions into the neighbouring sciences, as physics does with chemistry, for example, or chemistry with biology.

To all the sciences of external nature psychology offers the violent opposition of the moral to the physical world. It cannot be put in line with the physical sciences. It occupies, on the contrary, a position apart. It is the starting point, the most abstract and simple of the moral

sciences; and it bears the same relation to them that mechanics does to the physical.

All this is doubtless true; and yet a very great difficulty has been experienced in condensing into a clear definition the essence of psychology. This is proved by the multiplicity of definitions attempted. They are so many because none of them has proved completely satisfactory. Their abundance shows their insufficiency. I will try to introduce a little order into these attempts, and propose to distribute the definitions of psychology into the following categories:—

1. The definition by substance; the metaphysical definition *par excellence.*
2. The definition by enumeration.
3. „ „ method.
4. „ „ degree of certainty.
5. „ „ content.
6. „ „ point of view.
7. „ „ the peculiar nature of mental laws.

We will rapidly run through this series of efforts at definition, and shall criticise and reject nearly the whole of them; for the last alone seems exact—that is to say, in harmony with the ideas laid down above.

Metaphysical definition has to-day taken a slightly archaistic turn. Psychology used to be

considered as the *science of the soul.* This is quite abandoned. Modern authors have adopted the expression and also the idea of Lange,[1] who was, I think, the first to declare that we ought to cultivate a *soulless psychology.* This categorical declaration caused an uproar, and a few ill-informed persons interpreted it to mean that the new psychology which has spread in France under cover of the name of Ribot, sought to deny the existence of the soul, and was calculated to incline towards materialism. This is an error.

It is very possible, indeed, that several adepts of the new or experimental psychology may be materialists from inward conviction. The exclusive cultivation of external facts, of phenomena termed material, evidently tends—this is a mystery to none—to incline the mind towards the metaphysical doctrine of materialism. But, after making this avowal, it is right to add at once that psychology, as a science of facts, is the vassal of no metaphysical doctrine. It is neither spiritualist, materialist, nor monist, but a science of facts solely. Ribot and his pupils have proclaimed this aloud at every opportunity. Consequently it must be recognised that the rather amphibological expression "soulless psychology" implies no negation of the existence of the soul. It is—and this is quite a different thing—rather

[1] LANGE, *Histoire du Matérialisme*, II., 2me. partie, chap. iii.

an attitude of reserve in regard to this problem. We do not solve this problem; we put it on one side.

And, certainly, we are right to do so. The soul, viewed as a substance—that is, as a something distinct from psychical phenomena, which, while being their cause and support, yet remains inaccessible to our direct means of cognition—is only an hypothesis, and it cannot serve as objective to a science of facts. This would imply a contradiction in terms.

Unfortunately, we must confess that if it be right to relegate to metaphysics the discussion on the concept of the soul, it does not really suffice to purge our minds of all metaphysics; and a person who believes himself to be a simple and strict experimentalist is often a metaphysician without knowing it. These excommunications of metaphysics also seem rather childish at the present day. There is less risk than some years ago in declaring that: "Here metaphysics commence and positive science ends, and I will go no further." There is even a tendency in modern psychologists to interest themselves in the highest philosophical problems, and to take up a certain position with regard to them.

The second kind of definition is, we have said, that by enumeration. It consists in placing before

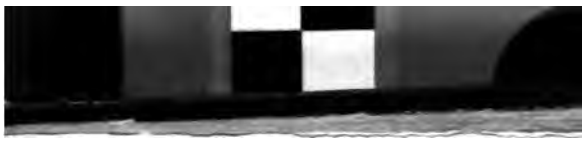
the eyes of the reader an assortment of psychological phenomena and then saying: "These are the things psychology studies." One will take readily as samples the ideas, reasonings, emotions, and other manifestations of mental life. If this is only a strictly provisional definition, a simple introduction to the subject, we accept it literally. It may serve to give us a first impression of things, and to refresh the memories of those who, by a rather extraordinary chance, would not doubt that psychology studies our thoughts. But whatever may be the number of these deeply ignorant persons, they constitute, I think, a negligible quantity; and, after these preliminaries, we must come to a real definition and not juggle with the problem, which consists in indicating in what the spiritual is distinguished from the material. Let us leave on one side, therefore, the definitions by enumeration.

Now comes the definition by method. Numbers of authors have supposed that it is by its method that psychology is distinguished from the other sciences.

To the mind is attached the idea of the within, to nature the idea of being without the mind, of constituting a "without" (*un dehors*). It is a vague idea, but becomes precise in a good many metaphors, and has given rise to several forms of speech. Since the days of Locke, we have

always spoken of the internal life of the mind as contrasted with the external life, of subjective reality as contrasted with objective reality; and in the same way we oppose the external senses to the inner sense (the internal perception), which it has at times been proposed to erect into a sixth sense. Though no longer quite the Cartesian dualism, this is still a dualism.

It has also been said that psychology is the science of introspection, and, in addition, that scientific psychology is a controlled introspection. This science of the "internal facts of man" would thus be distinguished from the other natural sciences which are formed by the use of our outer senses, by external observation—that is to say, to use a neologism, by externospection. This verbal symmetry may satisfy for a moment minds given to words, but on reflection it is perceived that the distinction between introspection and externospection does not correspond to a fundamental and constant difference in the nature of things or in the processes of cognition. I acknowledge it with some regret, and thus place myself in contradiction with myself; for I for a long time believed, and have even said in print, that psychology is the science of introspection. My error arose from my having made too many analyses of detail, and not having mounted to a sufficiently wide-reaching conception.



The definition I have given of consciousness is the implied condemnation of the above ideas. Consciousness, being nothing but an act of revelation, has neither a within nor a without; it does not correspond to a special domain which would be an inner one with regard to another domain.

Every consideration on the position of things is borrowed from the sphere of the object, and remains foreign to the sphere of the consciousness. It is by an abuse of language that we speak of the outer world in relation to the world of consciousness, and it is pure imagination on the part of philosophers to have supposed that our sensations are first perceived as internal states and states of consciousness, and are subsequently projected without to form the outer world. The notion of internal and external is only understood for certain objects which we compare by position to certain others.

In fact, we find that the opposition between an external and an internal series is generally founded on two characteristics: sensation is considered external in relation to the idea, and an object of cognition is considered as internal when it is accessible only to ourselves. When these two characteristics are isolated from each other, one may have doubts; but when they co-exist, then the outwardness or inwardness appears fully evidenced. We see then that this

distinction has nothing to do with the value of consciousness, and has nothing mental about it.

It is thus that our ideas are judged from internal events. It is our microcosm opposed to the macrocosm. It is the individual opposed to the social. Looking at an external object, we remain in communion with our fellows, for we receive, or think we receive, identical sensations. At all events, we receive corresponding sensations. On the other hand, my thought is mine, and is known to me alone; it is my sanctuary, my private closet, where others do not enter. Every one can see what I see, but no one knows what I think.

But this difference in the accessibility of phenomena is not due to their peculiar nature. It is connected with a different fact, with the modes of excitement which call them forth. If the visual sensation is common to all, it is because the exciting cause of the sensation is an object external to our nervous systems, and acting at a distance on all.[1] The tactile sensation is at the beginning more personal to the one who experiences it, since it requires contact; and the lower sensations are in this intimacy still in progress. And then, the

[1] Let us remark, in passing, how badly nature has organised the system of communication between thinking beings. In what we experience we have nothing in common with our fellows; each one experiences his own sensations and not those of others. The only meeting point of different minds is found in the inaccessible domain of the *noumena*.

same object can give rise, in common-place circumstances, to a sensation either common to all beings or special to one alone. The capsule of antipyrine which I swallow is, before my doing so, visible to all eyes; once in my mouth, I am the only one to perceive it. It is therefore possible that the same sensation, according to the displacements of the object which excites it, may make part of the internal or of the external series; and as all psychic life is sensation, even effort, and, as we are assured, emotion, it follows that our argument extends to all the psychical elements.

Finally, the internal or external character of events, which might be called their geographical position, is a characteristic which has no influence upon the method destined to take cognisance of it. The method remains one. Introspection does not represent a source of cognition distinct from externospection, for the same faculties of the mind—reason, attention, and reflection—act on sensation, the source of the so-called external sciences, and on the idea, the source of the so-called inner science. A fact can be studied by essentially the same process, whether regarded by the eyes or depicted by the memory. The consciousness changes its object and orientation, not its nature. It is as if, with the same opera-glass, we looked in turn at the wall of the room and through the window.

I can even quote on this point a significant fact: there are observers who are organised in such a way that they especially observe by memory. Placed before the sensorial phenomenon which strikes their senses, they are sometimes amazed, as if hypnotised; they require to get away from it to regain consciousness of themselves, to analyse the fact, and to master it, and it is by means of the memory that they study it, on condition, of course, of afterwards coming back to verify their conclusions by a fresh observation from nature. Will it be said that the physicist, the chemist, or the biologist who follows this slow method, and who thus observes retroactively, practises physics and biology by introspection? Evidently this would be ridiculous.

Conversely, introspection may, in certain cases, adopt the procedure of externospection. No doubt it would be inexact to say that the perception of one of our ideas always takes place through the same mechanism as the perception of one of our sensations. To give an account of what we think does not imply the same work as in the case of what we see; for, generally, our thoughts and our images do not appear to us spontaneously. They are first sought for by us, and are only realised after having been wished for. We go from the vague to the precise, from the confused to the clear: the direction of thought precedes,

then, its realisation in images; and the latter, being expected, is necessarily comprehended when it is formed. But we may come across curious circumstances in which it is the image which has precedence over its appearance, and in that case it is exact to say that this uninvoked image must be interpreted and recognised as if it were an external object. In cases of this kind, there passes through our mind something which surprises us. I see, by internal vision, a face with a red nose, and I have to search my memory for a long time, even for days, in order to give precision to the vague feeling that I have seen it before, so as to finally say with confidence, "It is So and So!" Or else I hear in my inner ear a certain voice, with a metallic tone and authoritative inflections: this voice pronounces scientific phrases, gives a series of lectures, but I know not to whom it belongs, and it costs me a long effort to reach the interpretation: it is the voice of M. Dastre! There is, then, a certain space of time, more or less long, in which we can correctly assert that we are not aware of what we are thinking; we are in the presence of a thought in the same state of uncertainty as in that of an external, unknown, and novel object. The labour of classification and of interpretation cast upon us is of the same order; and, when this labour is effected incorrectly, it may end in an illusion. Therefore

illusions of thought are quite as possible as illusions of the senses, though rarer for the reasons above stated. But the question of frequency has no theoretical importance.

I have shown elsewhere, by experiments on hysterics, that it is possible by the intermediary of their insensibility to touch to suggest ideas on the value of which the patients make mistakes. For instance, you take the finger in which they have no sensation, you touch it, you bend it. The patient, not seeing what is done, does not feel it, but the tactile sensation unfelt by their principal consciousness somehow awakes the visual image of the finger; this enters into the field of consciousness, and most often is not recognised by the subject, who describes the occurrence in his own way; he claims, for instance, that he thinks of sticks or of columns. In reality he does not know of what he is thinking, and we know better than he. He is thinking of his finger, and does not recognise it.

All these examples show that the clearly defined characteristics into which it is sought to divide extrospection and introspection do not exist. There is, however, a reason for preserving the distinction, because it presents a real interest for the psychology of the individual. These two words introspection and extrospection admirably convey the difference in the manner of thinking

between those who from preference look, and those who from preference reflect. On the one hand, the observers, who are often men of action; on the other, the speculators, who are often mystics. But it would be no more legitimate by this means to separate psychology and physics than to say, for instance, "There are two kinds of geology: one is the geology of France, for one is acquainted with it without going from home, and the other is that of the rest of the world, because in order to know it one must cross the frontier."

We reject, therefore, the definition drawn from the difference of method. At bottom there is no difference of method, but only differences of process, of *technique*. The method is always the same, for it is derived from the application of a certain number of laws to the objects of cognition, and these laws remain the same in all spheres of application.

Here is another difference of method which, if it were true, would have an incalculable importance. Psychology, we are told, is a science of direct and immediate experiment; it studies facts as they present themselves to our consciousness, while the natural sciences are sciences of indirect and mediate experiment, for they are compelled to interpret the facts of consciousness and draw from them conclusions on nature. It has also been said, in a more ambitious formula,

"The science of physical objects is relative; psychological science is absolute."

Let us examine this by the rapid analysis of any perception taken at haphazard. What I perceive directly, immediately, we are told, is not the object, it is my state of consciousness; the object is inferred, concluded, and taken cognisance of through the intermediary of my state of consciousness. We only know it, says Lotze, *circa rem*. It is therefore apprehended less immediately, and every natural science employs a more roundabout method than that of psychology. This last, by studying states of consciousness, which alone are known to us directly, comprehends reality itself, absolute reality. "There is more absolute reality," M. Rabier boldly says, "in the simple feeling that a man, or even an animal, has of its pain when beaten than in all the theories of physics, for, beyond these theories, it can be asked, what are the things that exist. But it is an absurdity to ask one's self if, beyond the pain of which one is conscious, there be not another pain different from that one."[1]

Let us excuse in psychologists this petty and common whim for exaggerating the merit of the science they pursue. But here the limit is really passed, and no scholar will admit that the perception and representation of a body, as it may take

[1] E. RABIER, *Leçons de Philosophie*, "Psychologie," p. 33.

place in the brain of a Berthelot, can present any inferiority as a cognition of the absolute, to the pain felt by the snail I crush under my foot. Nobody except metaphysicians will acknowledge that psychology is a more precise and certain science than physics or chemistry.

The criterion furnished by the development of the respective sciences would prove just the contrary. The observations of psychology are always rather unprecise. Psychological phenomena, notwithstanding the efforts of Fechner and his school, are not yet measured with the same strictness and ease as the tangible reality. To speak plainly, the psychologist who vaunts the superiority of his method, and only shows inferior results, places himself in a somewhat ridiculous and contradictory position; he deserves to be compared to those spiritualists who claim the power of evoking the souls of the illustrious dead and only get from them platitudes.

In the main the arguments of the metaphysicians given above appear to me to contain a grave error. This consists in supposing that the natural sciences study the reality hidden beneath sensation, and only make use of this fact as of a sign which enables them to get back from effect to cause. This is quite inexact. That the natural sciences are limited by sensation is true; but they do not go

outside it, they effect their constructions with sensation alone. And the reason is very simple: it is the only thing they know. To the metaphysical psychologist, who claims sensation as his own property, saying, "But this sensation is a state of my consciousness, it is mine, it is myself," the physicist has the right to answer: "I beg your pardon! this sensation is the external object that I am studying; it is my column of mercury, my spring, my precipitate, my amœba; I comprehend these objects directly, and I want no other." Psychology finds itself, therefore, exactly on the same footing as the other sciences in the degree in which it studies sensations that it considers as its own property. I have already said that the sensations proper to psychology are hardly represented otherwise than by the emotional sensations produced by the storms in the apparatus of organic life.

We now come to the definitions by content. They have been numerous, but we shall only quote a few. The most usual consists in saying, that *Psychology studies the facts of consciousness.* This formula passes, in general, as satisfactory. The little objection raised against it is, that it excludes the unconscious facts which play so important a part in explaining the totality of mental life; but it only requires some usual phrase to repair this omission. One might add, for in-

stance, to the above formula: conscious facts and those which, while unconscious under certain conditions, are yet conscious in others.

This is not, however, the main difficulty, which is far more serious. On close examination, it is seen that the term, *fact of consciousness*, is very elastic, and that for a reason easy to state. This is, that all facts which exist and are revealed to us reach us by the testimony of the consciousness, and are, consequently, facts of consciousness. If I look at a locomotive, and analyse its machinery, I act like a mechanic; if I study under the microscope the structure of infusoria, I practise biology; and yet the sight of the locomotive, the perception of the infusoria, are just facts of consciousness, and should belong to psychology, if one takes literally the above definition, which is so absolute that it absorbs the entire world into the science of the mind. It might, indeed, be remarked that certain phenomena would remain strictly psychological, such as, for instance, the emotions, the study of which would not be disputed by any physical science; for the world of nature offers us nothing comparable to an emotion or an effort of will, while, on the other hand, everything which is the object of physical science—that is, everything which can be perceived by our external senses—may be claimed by psychology. Therefore, it is very evident the above definition

is much too wide, and does not agree with *solo definito*. It does not succeed in disengaging the essential characteristic of physics. This characteristic indeed exists, and we foresee it, but we do not formulate it.

Another definition by content has not been much more happy. To separate the material from the moral, the conception of Descartes was remembered, and we were told that: "Psychology is the science of what exists only in time, while physics is the science of what exists at once in time and in space."

To this theoretical reasoning it might already be objected that, in fact, and in the life we lead, we never cease to localise in space, though somewhat vaguely, our thought, our Ego, and our intellectual whole. At this moment I am considering myself, and taking myself as an example. I am writing these lines in my study, and no metaphysical argument can cause me to abandon my firm conviction that my intellectual whole is in this room, on the second floor of my house at Meudon. I am here, and not elsewhere. My body is here; and my soul, if I have one, is here. I am where my body is; I believe even that I am within my body.

This localisation, which certainly has not the exactness nor even the characteristics of the localisation of a material body in space, seems to

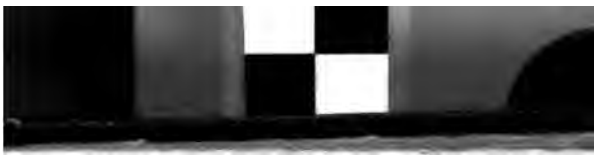
me to result from the very great importance we attach to the existence of our body in perception and in movement. Our body accompanies all our perceptions; its changes of position cause these perceptions to vary; the accidents which happen to it bring us pleasure or pain. Some of its movements are under our orders; we observe that others are the consequences of our thoughts and our emotions. It occupies, therefore, among the objects of cognition a privileged place, which renders it more intimate and more dear to us than other objects. There is no need to inquire here whether, in absolute reality, I am lodged within it, for this "I" is an artificial product manufactured from memories. I have before explained what is the value of the relation subject-object. It is indisputable that in the manufacture of the subject we bring in the body. This is too important an element for it not to have the right to form part of the synthesis; it is really its nucleus. As, on the other hand, all the other elements of the synthesis are psychical, invisible, and reduced to being faculties and powers, it may be convenient to consider them as occupying the centre of the body or of the brain. There is no need to discuss this synthesis, for it is one of pure convenience. As well inquire whether the personality of a public company is really localised at its registered offices, round the green

baize cover which adorns the table in the board-room.

Another definition of psychology, which is at once a definition by content and a definition by method, has often been employed by philosophers and physiologists. It consists in supposing that there really exist two ways of arriving at the cognition of objects: the within and the without. These two ways are as opposed to each other as the right and wrong side of a stuff. It is in this sense that psychology is the science of the within and looks at the wrong side of the stuff, while the natural sciences look at the right side. And it is so true, they add, that the same phenomenon appears under two radically different forms according as we look at it from the one or the other point of view. Thus, it is pointed out to us, every one of our thoughts is in correlation with a particular state of our cerebral matter; our thought is the subjective and mental face; the corresponding cerebral process is the objective and material face.

Then the difference between representation, which is a purely psychological phenomenon, and a cerebral state which is a material one, and reducible to movement, is insisted upon; and it is declared that these two orders of phenomena are separated by irreducible differences.

Lastly, to take account of the meaning of these



differences, and to explain them, it is pointed out that they are probably connected with the modes of cognition which intervene to comprehend the mental and the physical. The mental phenomenon, we are told, is comprehended by itself, and as it is; it is known without any mystery, and in its absolute reality. The physical phenomenon, on the contrary, only reaches us through the intermediary of our nerves, more or less transformed in consequence by the handling in transport. It is an indirect cognition which causes us to comprehend matter; we have of this last only a relative and apparent notion, which sufficiently explains how it may differ from a phenomenon of thought.

I have already had occasion to speak of this dualism, when we were endeavouring to define sensation. We return to its criticism once more, for it is a conception which in these days has become classic; and it is only by repeatedly attacking it that it will be possible to demonstrate its error.

To take an example: I look at the plain before me, and see a flock of sheep pass over it. At the same time an observer is by my side and is not looking at the same thing as myself. It is not at the plain that he looks; it is, I will suppose, within my brain. Armed with a microscope *à la* Jules Verne, he succeeds in seeing what is passing beneath my skull, and he notices within my fibres and nerve cells those phenomena of undulation which phy-

siologists have hitherto described hypothetically. This observer notices then, that, while I am looking over the plain, my optic nerve conveys a certain kind of movements—these are, I suppose, displacements of molecules which execute a complicated kind of dance. The movement follows the course of the optic nerve, traverses the chiasma, goes along the fascia, passes the internal capsule, and finally arrives at the visual centres of the occipital region. Here, then, are the two terms of comparison constituted: on the one hand, we have a certain representation—that is, my own; and on the other hand, coinciding with this representation, we have the dynamic changes in the nerve centres. These are the two things constituting the right and wrong side of the stuff. We shall be told: "See how little similarity there is here! A representation is a physical fact, a movement of molecules a material fact." And further, "If these two facts are so little like each other, it is because they reach us by two different routes."

I think both these affirmations equally disputable. Let us begin with the second. Where does one see that we possess two different sources of knowledge? Or that we can consider an object under two different aspects? Where are our duplicate organs of the senses, of which the one is turned inward and the other outward? In the example chosen for this discussion, I have

supposed two persons, each of whom experiences a visual perception. One looks at one object, the other at another; but both are looking with the same organs of sense, that is, with their eyes. How is it possible to understand that these eyes can, in turn, according to the necessity of the moment, see the two faces, physical and mental, of the same object?

They are the two faces of an identical object, is the answer made to us, because the two visions, although applied to the same object, are essentially different. On the one hand is a sensation of displacement, of movement, of a dance executed by the molecules of some proteid substance; on the other hand is a flock of sheep passing over the plain at a distance of a hundred metres away.

It seems to me that here also the argument advanced is not sound. In the first place, it is essential to notice that not only are the two paths of cognition identical, but also that the perceptions are of the same nature. There is in this no opposition between the physical and the mental. What is compared are the two phenomena, which are both mixed and are physico-mental—physical, through the object to which they are applied, mental, through the act of cognition they imply. To perceive an object in the plain and to perceive a dynamic state of the brain are two operations which each imply an act of cognition;

and, in addition, the object of this knowledge is as material in the one as in the other case. A flock of sheep is matter just as much as my brain.

No doubt, here are objects which differ; my observer and myself have not the same perception. I acknowledge, but do not wonder at it. How could our two perceptions be similar? I look at the sheep, and he at the interior of my brain. It is not astonishing that, looking at such different objects, we should receive images also different. Or, again, if this other way of putting it be preferred, I would say: the individual A looks at the flock through the intermediary of his nervous system, while B looks at it through that of two nervous systems, put as it were end to end (though not entirely), his own nervous system first, and then that of A. How, then, could they experience the same sensation?

They could only have an identical sensation if the idea of the ancients were to be upheld, who understood the external perception of bodies to result from particles detaching themselves from their bodies, and after a more or less lengthy flight, striking and entering into our organs of sense.[1]

Let us imagine, just for a moment, one of our

[1] This seems to have been the opinion of Democritus. The modern doctrine of radiation from the human body, if established, would go nearly as far as the supposition in the text. Up till now, however, it lacks confirmation.—ED.

nerves—the optic nerve, for instance—transformed into a hollow tube, along which the emissions of miniatures should wend their way. In this case, evidently, if so strange a disposition were to be realised, and if B could see what was flowing in the optic nerve of A, he would experience a sensation almost analogous to that of A. Whenever the latter saw a dog, a sheep, or a shepherd, B would likewise see in the optic canal minute dogs, microscopic sheep, and Lilliputian shepherds. At the cost of such a childish conception, a parity of content in the sensations of our two spectators A and B might be supposed. But I will not dwell on this.

The above considerations seem to me to explain the difference generally noticed between thought and the physiological process. It is not a difference of nature, an opposition of two essences, or of two worlds—it is simply a difference of object; just that which separates my visual perception of a tree and my visual perception of a dog. There remains to know in what manner we understand the relation of these two processes: this is another problem which we will examine later.

Since the content does not give us the differentiation we desire, we will abandon the definitions of psychology by content. What now remains? The definitions from the point of view. The same

fact may be looked at, like a landscape, from different points of view, and appears different with the changes therein. It is so with the facts we consider psychical, and the autonomy of psychology would thus be a matter of point of view.

It has, then, been supposed—and this is a very important proposition—that the distinctive feature of psychical facts does not consist in their forming a class of particular events. On the contrary, their characteristic is to be studied in their dependency on the persons who bring them about. This interesting affirmation is not new: it may be read in the works of Mach, Külpe, Münsterberg, and, especially, of Ebbinghaus, from whom I quote the following lines of quite remarkable clearness: "Psychology is not distinguished from sciences like physics and biology, which are generally and rightly opposed to it, by a different content, in the way that, for instance, zoology is distinguished from mineralogy or astronomy. It has the same content, but considers it from a different point of view and with a different object. It is the science, not of a given part of the world, but of the whole world, considered, however, in a certain relation. It studies, in the world, those formations, processes, and relations, the properties of which are essentially determined by the properties and functions of

an organism, of an organised individual. . . . Psychology, in short, considers the world from an individual and subjective point of view, while the science of physics studies it as if it were independent of us."

Over these definitions by point of view, one might quibble a little; for those who thus define psychology are not always consistent with themselves. In other passages of their writings they do not fail to oppose psychical to physiological phenomena, and they proclaim the irreducible heterogeneity of these two orders of phenomena and the impossibility of seeing in physics the producing cause of the moral. Ebbinghaus is certainly one of the modern writers who have most strongly insisted on this idea of opposition between the physiological and the psychical, and he is a convinced dualist. Now I do not very clearly understand in what the principle of heterogeneity can consist to a mind which admits, on the other hand, that psychology does not differ from the physical sciences by its content.

However, I confine myself here to criticising the consequences and not the starting point. The definition of the psychical phenomenon by the point of view seems to me correct, although it has more concision than clearness; for it rests especially upon a material metaphor, and the expression "point of view" hardly applies except

to the changes of perspective furnished by visible objects.

It would be more exact to say that psychology specially studies certain objects of cognition, such as those which have the character of representations (reminiscences, ideas, concepts), the emotions, the volitions, and the reciprocal influences of these objects among themselves. It studies, then, a part of the material world, of that world which till now has been called psychological, because it does not come under the senses, and because it is subjective and inaccessible to others than ourselves; it studies the laws of those objects, which laws have been termed mental.[1]

These laws are not recognised, popularly speaking, either in physics or in biology; they constitute for us a cognition apart from that of the natural world. Association by resemblance, for example, is a law of consciousness; it is a psychological law which has no application nor counterpart in the world of physics or biology. We may therefore sum up what has been said by the statement that

[1] I am compelled, much against my will, to use throughout this passage an equivocal expression, that of "mental law," or law of consciousness, or psychological law. I indicate by this the laws of contiguity and of similarity; as they result from the properties of the images, and as these are of a material nature, they are really physical and material laws like those of external nature. But how can all these laws be called physical laws without running the risk of confusing them one with the other?

psychology is the study of a certain number of laws, relations, and connections.

As to the particular feature which distinguishes mental from physical laws, we can formulate it, as does William James, by saying that the essence of a mental law is to be teleological, or, if the phrase be preferred, we can say that mental activity is a finalistic activity, which expends itself as will in the pursuit of future ends, and as intelligence in the choice of the means deemed capable of serving those ends. An act of intelligence is recognised by the fact of its aiming at an end, and employing for this end one means chosen out of many. Finality and intelligence are thus synonymous. In opposition to mental law, physical law is mechanical, by which expression is simply implied the absence of finality. Finality opposed to mechanism; such is the most concise and truest expression in which must be sought the distinctive attribute of psychology and of the moral sciences, the essential characteristic by which psychological are separated from physical facts.

I think it may be useful to dwell a little on the mental laws which I have just opposed to the physical, and whose object is to assure preadaptation and form a finality.[1] Their im-

[1] *Finality* seems to be here used in the sense of the doctrine which regards perfection as the final cause of existence.—ED.

portance cannot be exaggerated. Thanks to his power of preadaptation, the being endowed with intelligence acquires an enormous advantage over everything which does not reason. No doubt, as has been shrewdly remarked, natural selection resembles a finality, for it ends in an adaptation of beings to their surroundings. There is therefore, strictly speaking, such a thing as finality without intelligence. But the adaptation resulting therefrom is a crude one, and proceeds by the elimination of all that does not succeed in adapting itself; it is a butchery. Real finalism saves many deaths, many sufferings, and many abortions.[1]

Let us examine, then, the process of preadaptation; it will enable us to thoroughly comprehend, not only the difference between the physical and the psychical laws, but the reason why the psychical manages in some fashion to mould itself upon the physical law.

Now, the means employed by preadaptation is, if we take the matter in its simplest form, to be aware of sensations before they are experienced. If we reflect that all prevision implies a previous knowledge of the probable trend of events, it will be understood that the part played by intelligence consists in becoming imbued with the laws of nature, for the purpose of imitating its

[1] See a very interesting article by E. GOBLOT, "La Finalité sans Intelligence," *Revue de Métaphysique*, July 1900.

workings. By the laws of nature, we understand here only that order of real sensations, the knowledge of which is sufficient to fulfil the wants of practical life. To us there are always gaps in this order, because the sensation it is important for us to know is separated from us either by the barriers of time or of space, or by the complication of useless sensations. Thence the necessity of interpolations. That which we do not perceive directly by our senses, we are obliged to represent to ourselves by our intelligence; the image does the work of sensation, and supplements the halting sensation in everything which concerns adaptation.

To replace the inaccessible sensation by the corresponding image, is therefore to create in ourselves a representation of the outer world which is, on all the points most useful to us, more complete than the direct and sensorial presentation of the moment. There is in us a power of creation, and this power exercises itself in the imitation of the work of nature; it imitates its order, it reconstitutes on the small scale adapted to our minds, the great external order of events. Now, this work of imitation is only really possible if the imitator has some means at his disposal analogous to those of the model.

Our minds could not divine the designs of nature, if the laws of images had nothing in

common with the laws of nature. We are thus led to confront these two orders of laws with each other; but, before doing so, one more preliminary word is necessary. We have up till now somewhat limited the problem, in order to understand it. We have reduced the psychological being to one single function, the intellectual, and to one single object of research, the truth. This is, however, an error which has often been committed, which is now known and catalogued, called intellectualism, or the abuse of intellectualism. It is committed for this very simple reason, that it is the intellectual part of our being which best allows itself to be understood, and, so to speak, intellectualised. But this leaves out of the question a part of our entire mental being so important and so eminent, that if this part be suppressed, the intelligence would cease to work and would have no more utility than a machine without motive power. Our own motive power is the will, the feeling, or the tendency. Will is perhaps the most characteristic psychical function, since, as I have already had occasion to say, nothing analogous to it is met with in the world of nature. Let us therefore not separate the will from the intelligence, let us incarnate them one in the other; and, instead of representing the function of the mind as having for its aim knowledge, foresight, the combination of means, and self-adaptation, we shall be much

nearer the truth in representing to ourselves a being who *wills* to know, *wills* to foresee, and *wills* to adapt himself, for, after all, he *wills* to live.

Having said this, let us compare the psychological law and that of nature. Are they identical? We shall be told that they are not, since, as a fact, errors are committed at every moment by the sudden failures of human reason. This is the first idea which arises. Human error, it would seem, is the best proof that the two laws in question are not alike, and we will readily add that a falling stone does not mistake its way, that the crystal in the course of formation does not miss taking the crystalline shape, because they form part of physical nature, and are subject in consequence to its determinism. But this is faulty reasoning, and a moment of reflection demonstrates it in the clearest possible manner; for adaptation may miss its aim without the being who adapts himself and his surroundings necessarily obeying different laws. When the heat of a too early spring causes buds to burst forth prematurely which are afterwards destroyed by frost, there is produced a fault of adjustment which resembles an error of adaptation, and the bringing forward of this error does not necessarily imply that the tree and the whole of physical nature are obeying different laws.

Moreover, the difference between the laws of nature and those of the understanding does not need deduction by reasoning from an abstract principle; it is better to say that it is directly observable, and this is how I find that it presents itself to us.

The essential law of nature is relatively easy to formulate, as it is comprised in the very definition of law. It simply consists in the sentence: uniformity under similar conditions. We might also say: a constant relation between two or several phenomena, which can also be expressed in a more abstract way by declaring that the law of nature rests on the combination of two notions, identity and constancy.

On the other hand, the laws of our psychical activity partly correspond to the same tendencies, and it would be easy to demonstrate that the microcosm of our thoughts is governed by laws which are also an expression of these two combined notions of constancy and identity. It is, above all, in the working of the intellectual machine, the best known and the most clearly analysed up till now, that we see the application of this mental law which resembles, as we say, on certain sides, the physical law: and the best we can do for our demonstration will doubtless be to dissect our reasoning powers. Reason, a process essential to thought in action, is developed

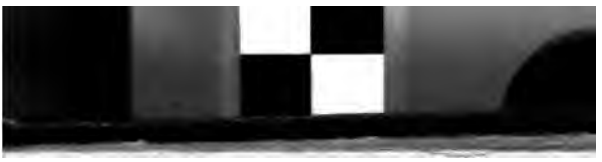
in accordance with a law which resembles in the most curious manner a physical law. It resembles it enough to imitate it, to conform to it, and, so to speak, to mould itself on it.

Now, the reason does not follow the caprices of thought, it is subject to rules; it results from the properties of the images, those properties which we have above referred to, the material character of which we have recognised, and which are two in number—similarity and contiguity, as they are termed in the jargon of the schools. They are properties which have for their aim to bring things together, to unite, and to synthetise. They are unceasingly at work, and so apparent in their labour that they have long been known. We know, since the time of Aristotle, that two facts perceived at the same time reproduce themselves together in the memory—this is the law of contiguity; and that two facts perceived separately, but which are similar, are brought together in our mind—this is the law of similarity.

Now, similarity and contiguity form by combination the essential part of all kinds of reasoning, and this reasoning, thus understood, works in a fashion which much resembles (we shall see exactly in what degree) a physical law. I wish to show this in a few words. What renders my demonstration difficult and perhaps obscure is, that we shall

be obliged to bring together rather unexpectedly categories of phenomena which are generally considered separate.

The distinctive attribute of the reason consists, as I have said, in the setting to work of these two elementary properties, similarity and contiguity. It consists, in fact, in extending continuity by similarity; in endowing with identical properties and similar accompaniments things which resemble each other; in other words, it consists in impliedly asserting that the moment two things are identical in one point they are so for all the rest. This will be fairly well understood by imagining what takes place when mental images having the above-mentioned properties meet. Suppose that B is associated with C, and that A resembles B. In consequence of their resemblance the passing from A to B is easy; and then B suggesting C by contiguity, it happens that this C is connected with A—connected, though, in reality, they have never been tried together. I say they are associated on the basis of their relation to B, which is the rallying point. It is thus that, on seeing a piece of red-hot iron (A), I conclude it is hot (C), because I recollect distinctly or unconsciously another piece of red-hot iron (B), of which I once experienced the heat. It is this recollection B which logicians, in their analysis of logical, verbal, and formal argument, call the



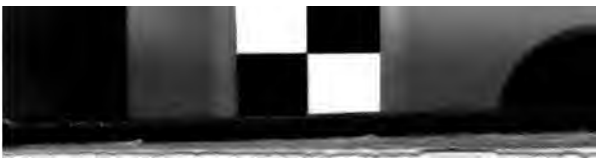
middle term. Our representation of the process of reasoning is not special to argument. It also expresses the process of invention, and every kind of progress from the known to the unknown. It is an activity which creates relations, which assembles and binds together, and the connections made between different representations are due to their partial identities, which act as solder to two pieces of metal.

It will now be understood that these relations between the images curiously resemble the external order of things, the order of our sensations, the order of nature, the physical law. This is because this physical law also has the same character and expresses itself similarly. We might say "all things which resemble each other have the same properties," or "all things alike on one point resemble each other on all other points." But immediately we do so, the difference between the physical and the mental law becomes apparent. The formula we have given is only true on condition that many restrictions and distinctions are made.

The process of nature is so to do that the *same* phenomenon always unfolds itself in the same order. But this process is not always comprehended in real life, for it is hidden from our eyes by the manifold combinations of chance; in the reality that we perceive there is a crowd of phenomena

which resemble each other but are not really the same. There are a number of phenomena which co-exist or follow each other without this order of co-existence or succession being necessary or constant. In other words, there are resemblances which are the marks of something, as a logician would say, and others which are not the marks of anything; there are relations of time and space which are the expression of a law; there are some which are accidental, and may possibly never be reproduced.

It would be a wonderful advantage if every scientific specialist would make out a list of the non-significant properties that he recognises in matter. The chemist, for example, would show us that specific weight has hardly any value in diagnosis, that the crystalline form of a salt is often not its own, that its colour especially is almost negligible because an immense number of crystals are white or colourless, that precipitation by a given substance does not ordinarily suffice to characterise a body, and so on. The botanist, on his part, would show us that, in determining plants, absolute dimension is less important than proportion, colour less important than form, certain structures of organs less important than others. The pathologist would teach us that most pathological symptoms have but a trivial value; the cries, the enervation, the agitation



of a patient, even the delirium which so affects the bystanders, are less characteristic of fever than the rate of his pulse, and the latter less than the temperature of the armpit or the dryness of the tongue, &c. At every moment the study of science reveals resemblances of facts and contiguities of facts which must be neglected for the sake of others. And if we pass from this profound knowledge of the objects to the empirical knowledge, to the external perception of bodies, it is in immense number that one espies around one traps laid by nature. The sound we hear resembles several others, all produced by different causes; many of our visual sensations likewise lend themselves to the most varied interpretations; by the side of the efficient cause of an event we find a thousand entangled contingencies which appear so important that to disentangle them we are as much perplexed as the savage, who, unable to discriminate between causes and coincidences, returns to drink at the well which has cured him, carefully keeping to the same hour, the same gestures, and the same finery.

The reason of this is that the faculty of similarity and the faculty of contiguity do not give the distinction, necessary as it is, between resemblances and co-existences which are significant and those which are not. The causal nexus between two phenomena is not perceived as

something apart and *sui generis;* it is not even perceived at all. We perceive only their relation in time and space, and it is our mind which raises a succession to the height of a causal connection, by intercalating between cause and effect something of what we ourselves feel when we voluntarily order the execution of a movement. This is not the place to inquire what are the experimental conditions in which we subject phenomena to this anthropomorphic transformation; it will suffice for us to repeat here that, in perception, a chance relation between phenomena impresses us in the same way as when it is the expression of a law.

Our intellectual machine sometimes works in accord with the external law and at others makes mistakes and goes the wrong way. Then we are obliged to correct it, and to try a better adjustment, either by profounder experimenting with nature (methods of concordance, discordance, variations, &c.), or by a comparison of different judgments and arguments made into a synthesis; and this collaboration of several concordant activities ends in a conclusion which can never represent the truth, but only the probable truth. The study of the laws of the mind shows us too clearly, in fact, their fluidity with regard to the laws of nature for us not to accept probabilism. There exists no certitude—only very

varied degrees of probability. Daily practice contents itself with a very low degree of probability; judicial logic demands a rather higher one, especially when it is a question of depriving one of our fellow-creatures of liberty or life. Science claims one higher still. But there is never anything but differences of degrees in probability and conjecture.

This, then, is the definition of psychology that we propose. It studies a certain number of laws which we term mental, in opposition to those of external nature, from which they differ, but which, properly speaking, do not deserve the qualification of mental, since they are —or at least the best known of them are—laws of the images, and the images are material elements. Although it may seem absolutely paradoxical, psychology is a science of matter—the science of a part of matter which has the property of preadaptation.

BOOK III

THE UNION OF THE SOUL[1] AND THE BODY

[1] See note on p. 4.

CHAPTER I

THE MIND HAS AN INCOMPLETE LIFE

THE problem of the union of the mind and the body is not one of those which present themselves in pure speculation; it has its roots in experimental facts, and is forced upon us by the necessity of explaining observations such as those we are about to quote.

The force of our consciousness, the correctness of our judgments, our tempers and our characters, the state of health of our minds, and also their troubles, their weaknesses, and even their existence, are all in a state of strict dependence on the condition of our bodies, more precisely with that of our nervous systems, or, more precisely still, with the state of those three pounds of proteid substance which each of us has at the back of his forehead, and which are called our brains. This is daily demonstrated by thousands upon thousands of observations.

The question is to know how this union of the body with the consciousness is to be explained, it being assumed that the two terms of this union present a great difference in their nature. The

easier it seems to demonstrate that this union exists, the more difficult it appears to explain how it is realised; and the proof of this difficulty is the number of divergent interpretations given to it. Were it a simple question of fact, the perpetual discussions and controversies upon it would not arise.

Many problems here present themselves. The first is that of the genesis or origin of the consciousness. It has to be explained how a psychical phenomenon can appear in the midst of material ones. In general, one begins by supposing that the material phenomena are produced first; they consist, for instance, in the working of the nervous centres. All this is physical or chemical, and therefore material. Then at a given moment, after this mechanical process, a quite different phenomenon emerges. This is thought, consciousness, emotion. Then comes the question whether this production of thought in the midst of physical phenomena is capable of explanation, and how thought is connected with its physical antecedents. What is the nature of the link between them? Is it a relation of cause to effect, of genesis? or a coincidence? or the interaction of two distinct forces? Is this relation constant or necessary? Can the mind enjoy an existence independent of the brain? Can it survive the death of the brain?

The second question is that of knowing what is the rôle, the utility, and the efficacity of the psychical phenomenon. Once formed, this phenomenon evolves in a certain direction and assumes to us who have consciousness of it a very great importance. What is its action on the material phenomena of the brain which surround it? Does it develop according to laws of its own, which have no relation to the laws of brain action? Does it exercise any action on these intra-cerebral functions? Does it exercise any action on the centrifugal currents which go to the motor nerves? Is it capable of exciting a movement? or is it deprived of all power of creating effect?

We will briefly examine the principal solutions which the imagination of mankind has found for these very difficult problems. Some of the best known of these solutions bear the names of spiritualism, materialism, parallelism, and monism. We will speak of these and of some others also.

Before beginning our critical statement, let us recall some of the results of our previous analyses which here intrude themselves, to use the ambitious language of Kant, as the prolegomena to every future solution which claims the title of science. In fact, we are now no longer at the outset of our investigation. We have had to acknowledge the exactness of certain facts, and we are bound to admit their consequences.

Notably, the definition of psychical phenomena at which we arrived, not without some trouble, will henceforth play a rather large part in our discussion. It will force us to question a great metaphysical principle which, up till now, has been almost universally considered as governing the problem of the union of the mind with the body.

This principle bears the name of the *axiom of heterogeneity*, or the principle of *psycho-physical dualism*. No philosopher has more clearly formulated it, and more logically deduced its consequences, than Flournoy. This author has written a little pamphlet called *Métaphysique et Psychologie*, wherein he briefly sets forth all the known systems of metaphysics by reducing them to the so-called principle of heterogeneity; after this, the same principle enables him to "execute" them. He formulates it in the following terms: "body and mind, consciousness and the molecular cerebral movement of the brain, the psychical fact and the physical fact, although simultaneous, are heterogeneous, unconnected, irreducible, and obstinately two."[1] The same author adds: "this is evident of itself, and axiomatic. Every physical, chemical, or physiological event, in the last resort, simply consists, according to science, in a more or less rapid displacement of a certain

[1] For reference, see note on p. 73.—ED.

number of material elements, in a change of their mutual distances or of their modes of grouping. Now, what can there be in common, I ask you, what analogy can you see, between this drawing together or moving apart of material masses in space, and the fact of having a feeling of joy, the recollection of an absent friend, the perception of a gas jet, a desire, or of an act of volition of any kind?" And further on: "All that we can say to connect two events so absolutely dissimilar is, that they take place *at the same time*. . . . This does not mean that we wish to reduce them to unity, or to join them together by the link of causality . . . it is impossible to conceive any real connection, any internal relation between these two unconnected things."

Let us not hesitate to denounce as false this proposition which is presented to us as an axiom. On looking closely into it, we shall perceive that the principle of heterogeneity does not contain the consequences it is sought to ascribe to it. It seems to me it should be split up into two propositions of very unequal value: 1, the mind and body are heterogeneous; 2, by virtue of this heterogeneity it is not possible to understand any direct relation between the two.

Now, if the first proposition is absolutely correct, in the sense that consciousness and matter are heterogeneous, the second proposition seems to us

directly contrary to the facts, which show us that the phenomena of consciousness are incomplete phenomena. The consciousness is not sufficient for itself; as we have said, it cannot exist by itself. This again, if you like, is an axiom, or rather it is a fact shown by observation and confirmed by reflection. Mind and matter brought down to the essential, to the consciousness and its object, form a natural whole, and the difficulty does not consist in uniting but in separating them. Consider the following fact: "I experience a sensation, and I have consciousness of it." This is the coupling of two things—a sensation and a cognition.

The two elements, if we insist upon it, are heterogeneous, and they differ qualitatively; but notwithstanding the existing prejudice by reason of which no direct relation, no commerce, can be admitted between heterogeneous facts, the alliance of the consciousness and the sensation is the natural and primitive fact. They can only be separated by analysis, and a scrupulous mind might even ask whether one has the right to separate them. I have a sensation, and I have consciousness of it. If not two facts, they are one and the same. Now, sensation is matter and my consciousness is mind. If I am judging an assortment of stuffs, this assortment, or the sensation I have of them, is a particle of matter, a material state, and my judgment on this sensation is the psychical

phenomenon. We can neither believe, nor desire, nor do any act of our intelligence without realising this welding together of mind and matter. They are as inseparable as motion and the object that moves; and this comparison, though far-fetched, is really very convenient. Motion cannot exist without a mobile object; and an object, on the other hand, can exist without movement. In the same way, sensation may exist without the consciousness; but the converse proposition, consciousness without sensation, without an object, an empty consciousness or a "pure thought," cannot be understood.

Let us mark clearly how this union is put forward by us. We describe it after nature. It is observation which reveals to us the union and the fusion of the two terms into one. Or, rather, we do not even perceive their union until the moment when, by a process of analysis, we succeed in convincing ourselves that that which we at first considered single is really double, or, if you like, can be made into two by the reason, without being so in reality. Thus it happens that we bring this big problem in metaphysics on to the field of observation.

Our solution vaguely resembles that which has sometimes been presented under the ancient name of *physical influx*, or under the more modern name of *inter-actionism*. There are many authors

who maintain that the soul can act directly on the body and modify it, and this is what is called inter-actionism. Thereby is understood, if I mistake not, an action from cause to effect, produced between two terms which enjoy a certain independence with regard to each other. This interpretation is indubitably close to ours, though not to be confused with it. My personal interpretation sets aside the idea of all independence of the mind, since it attributes to the mind an incomplete and, as it were, a virtual existence.

If we had to seek paternity for ideas I would much rather turn to Aristotle. It was not without some surprise that I was able to convince myself that the above theory of the relations between the soul and the body is to be found almost in its entirety in the great philosopher. It is true that it is mixed up with many accessory ideas which are out of date and which we now reject; but the essential of the theory is there very clearly formulated, and that is the important point. A few details on this subject will not be out of place. I give them, not from the original source, which I am not erudite enough to consult direct, but from the learned treatise which Bain has published on the psychology of Aristotle, as an appendix to his work on the Senses and the Intelligence.

The whole metaphysics of Aristotle is dominated by the distinction between form and matter. This

distinction is borrowed from the most familiar fact in the sensible world—the form of solid objects. We may name a substance without troubling ourselves as to the form it possesses, and we may name the form without regard to the substance that it clothes. But this distinction is a purely abstract one, for there can be no real separation of form from matter, no form without matter, and no matter without form. The two terms are correlative; each one implies the other, and neither can be realised or actualised without the other. Every individual substance can be considered from a triple point of view: 1st, form; 2nd, matter; and 3rd, the compound or aggregate of form and matter, the inseparable *Ens*, which transports us out of the domain of logic and abstraction into that of reality.

Aristotle recognises between these two logical correlatives a difference in rank. Form is superior, nobler, the higher in dignity, nearer to the perfect entity; matter is inferior, more modest, more distant from perfection. On account of its hierarchical inferiority, matter is often presented as the second, or *correlatum*, and form as the first, or *relatum*. This difference in rank is so strongly marked, that these two correlations are likewise conceived in a different form—that of the potential and the actual. Matter is the potential, imperfect, roughly outlined element which is

not yet actual, and may perhaps never become so. Form is the actual, the energy, the entelechy which actualises the potential and determines the final compound.

These few definitions will make clear the singularly ingenious idea of Aristotle on the nature of the body, the soul, and of their union. The body is matter which is only intelligible as the *correlatum* of form; it can neither exist by itself nor be known by itself—that is to say, when considered outside this relation. The soul is form, the actual. By uniting with the body it constitutes the living subject. The soul is the *relatum*, and is unintelligible and void of sense without its *correlatum*. "The soul," says Aristotle, "is not a variety of body, but it could not exist without a body: the soul is not a body, but something which belongs or is relative to a body." The animated subject is a form plunged and engaged in matter, and all its actions and passions are so likewise. Each has its formal side which concerns the soul, and its material side which concerns the body. The emotion which belongs to the animated subject or aggregate of soul and body is a complex fact having two aspects logically distinguishable from each other, each of which is correlative to the other and implies it. It is thus not only with our passions, but also with our perceptions, our imaginations, reminiscences,

reasonings, and efforts of attention to learn. Intelligence, like emotion, is a phenomenon not simply of the corporeal organism nor of the *Noûs* only, but of the commonalty or association of which they are members, and when the intelligence weakens it is not because the *Noûs* is altered, but because the association is destroyed by the ruin of the corporeal organism.

These few notes, which I have taken in their integrity from Bain's text, allow us thoroughly to comprehend the thought of Aristotle, and it seems to me that the Greek philosopher, by making of the soul and body two correlative terms, has formed a comparison of great exactness. I also much admire his idea according to which it is through the union of the body and soul that the whole, which till then was only possible, goes forth from the domain of logic and becomes actual. The soul actualises the body, and becomes, as he said, its entelechy.

These views are too close to those I have myself just set forth for it to be necessary to dwell on their resemblance. The latter would become still stronger if we separated from the thought of Aristotle a few developments which are not essential, though he allowed them great importance: I refer to the continual comparison he makes with the form and matter of corporeal objects. Happy though it may be, this comparison is but

a metaphor which perhaps facilitates the understanding of Aristotle's idea, but is not essential to his theory. For my part, I attach far greater importance to the character of *relatum* and *correlatum* ascribed to the two terms mind and matter, and to the actualisation[1] produced by their union.

Let me add another point of comparison. Aristotle's theory recalls in a striking manner that of Kant on the *a priori* forms of thought. The form of thought, or the category, is nothing without the matter of cognition, and the latter is nothing without the application of form. "Thoughts without content given by sensation are empty; intuitions without concept furnished by the understanding are blind." There is nothing astonishing in finding here the same illustration, since there is throughout a question of describing the same phenomenon,—the relation of mind to matter.

There remains to us to review the principal types of metaphysical systems. We shall discuss these by taking as our guide the principle we have just evolved, and which may be thus formulated: *The phenomena of consciousness constitute an incomplete mode of existence.*

[1] *i.e.* rendering actual.—ED.

CHAPTER II

SPIRITUALISM [1] AND IDEALISM

FLOURNOY has somewhere written that the chief interest of the systems of metaphysics lies less in the intellectual constructions they raise than in the aspirations of the mind and of the heart to which they correspond. Without taking literally this terribly sceptical opinion, it would be highly useful to begin the study of any metaphysical system by the psychology of its author. The value of each system would be better understood, and their reasons would be comprehended.

This book is too short to permit us to enter into such biographical details. I am obliged to take the metaphysical systems *en bloc*, as if they were anonymous works, and to efface all the shades, occasionally so curious, that the thought of each author has introduced into them. Yet, however brief our statement, it seems indispensable to in-

[1] It is, perhaps, needless to point out that by "spiritualism" M. Binet does not mean the doctrine of the spirit-rappers, whom he, like other scientific writers, designates as "spiritists," but the creed of all those who believe in disembodied spirits or existences.—ED.

dicate clearly the physical or moral idea concealed within each system.

Spiritualism

It is known that spiritualism is a doctrine which has for its chief aim the raising of the dignity of man, by recognising in him faculties superior to the properties of matter. We constantly meet, in spiritualism, with the notion of superior and inferior, understood not only in an intellectual sense but also in the sense of moral worth.

It will also be remarked, as a consequence of the above principle, that a spiritualist does not confine himself to discussing the ideas of his habitual adversary, the materialist; he finds them not only false, but dangerous, and is indignant with them; some persons even ingenuously acknowledge that they hold firmly to certain principles because they fear to be converted to materialism. I can also discern in this system a very natural horror of death, which inspires in so many people, of whom I am one, both hatred and disgust. The spiritualist revolts against the prospect of a definitive annihilation of thought, and the system he adopts is largely explained as an effort towards immortality.

This effort has led to the theory of two substances, the soul and the body, which are re-

presented as being as thoroughly separated as possible. The soul has not its origin in the body, and it derives none of its properties from its fellow; it is a substance created in complete independence relatively to the body; the soul, in its essence, has nothing in common with matter. The essence of the soul, said Descartes, is thought; the essence of the body is extent. It follows from this that the soul, in its determinations and actions, is liberated from the laws and necessities of the corporeal nature; it is a free power, a power of indetermination, capable of choice, capable of introducing new, unforeseen, and unforeseeable actions, and on this point opposes itself to corporeal phenomena, which are all subject to a determinism so rigorous that any event could be foreseen if its antecedents were known. Another consequence of spiritualism is the admission of the immortality of the soul, which, being widely distinct from the body, is not affected by its dissolution; it is, on the contrary, liberated, since death cuts the link which binds them together.

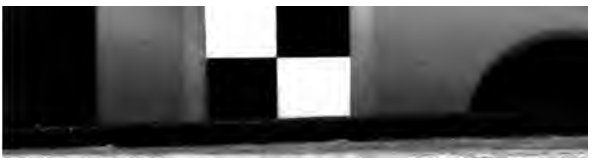
But there is a link, and the explanation of this link brings with it the ruin of the whole system. One is forced to admit that this principle of the separation of body and soul is liable, in fact, to many exceptions. Even if they are two isolated powers, the necessities of life oblige them to enter continually into communication with each other.

In the case of perceptions, it is the body which acts on the soul and imparts sensations to it; in movements, it is the soul, on the contrary, which acts on the body, to make it execute its desires and its will.

Spiritualists must acknowledge that they are at some trouble to explain this traffic between the two substances; for, with their respect for the principle of heterogeneity mentioned above, they do not manage to conceive how that contact of the physical and the mental can be made which is constantly necessary in the life of relation. By what means, have they long asked themselves, can that which is only extent act on that which is only thought? How can we represent to ourselves this *local* union of matter with an immaterial principle, which, by its essence, does not exist in space? The two substances have been so completely separated, to insure the liberty of the soul and its superiority over the body, that it has become impossible to bring them together. The scission has been too complete. They cannot be sewn together again.

Such are the principal objections raised against spiritualism. These objections are derived from points of view which are not ours, and we have therefore no need to estimate their value.

From our point of view, the spiritualist conception has chosen an excellent starting point. By



establishing the consciousness and the object of cognition as two autonomous powers, neither of which is the slave of the other, spiritualism has arrived at an opinion of irreproachable exactness; it is indeed thus that the relations of these two terms must be stated; each has the same importance and the right to the same autonomy.[1]

Yet, spiritualism has not rested there, and, by a lamentable exaggeration, it has thought that the consciousness, which it calls the soul, could exercise its functions in complete independence of the object of cognition, which it calls matter. There is the error. It consists in misunderstanding the incomplete and, as it were, virtual existence of the consciousness. This refutation is enough as regards spiritualism. Nothing more need be added.

Idealism

Idealism is an exceedingly complex system, varying much with varying authors, very polymorphous, and consequently very difficult to discuss.

The ancient hylozoism, the monadism of Leibnitz, and the recent panpsychism of M. Strong are only different forms of the same doctrine.

[1] I do not insist on the difference between my conception and the spiritualistic conception; my distinction between consciousness and matter does not correspond, it is evident, to that of "facts of consciousness" and "physical facts" which spiritualism sets up.

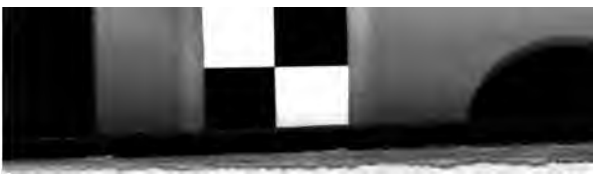
Like spiritualism, with which it is connected by many ties, idealism is a philosophy which expresses some disdain for matter, but the thoughts which have sought to shelter themselves under this philosophy are so varied that it would be perilous to try to define them briefly.

There can be discussed in idealism a certain number of affirmations which form the basis of the system. None of these affirmations is, strictly speaking, demonstrated or demonstrable; but they offer very different degrees of probability, and it is for this reason that we shall notice them.

Amongst these affirmations there are some that we have already met with in our study of the definition of sensation; others will be newer to us.

1. Here is one which seems to arise directly from the facts, and appears for a long time to have constituted an impregnable position for idealists. It may be expressed in three words: *esse est percipi.*

Starting with the observation that every time we bear witness to the existence of the external world, it is because we perceive it, idealists admit that the existence of this external world shares exactly the lot of our perception, and that like it it is discontinuous and intermittent. When we close our eyes, it ceases to exist, like a torch which is extinguished, and lights up again when we open



them. We have already discussed this proposition, and have shown that it contains nothing imperative; and we may very well decline to subscribe to it.

2. There follows a second proposition, barely distinct from the previous one. There should be nothing else in objects but that which we perceive, and that of which we have consciousness should be, in the fullest possible acceptation of the words, the measure of what is. Consequently there should be no need to seek, under the object perceived, another and larger reality, a source from which might flow wider knowledge than that we at present possess. This is as disputable as the preceding affirmation, and for the same reasons.

3. The third proposition is the heart of the idealist thesis. It is sometimes presented as a deduction from the foregoing, but it is nevertheless thoroughly distinct from it, and the preceding affirmations might legitimately be accepted and this new one rejected. This proposition may be expressed thus: *Everything that is perceived is psychical.*

It is not only idealists who subscribe to this opinion, however, and we have seen, when dealing with the definition of matter, that it is widely spread. We understand by it that the objects we perceive exist in the consciousness, are of the

consciousness, and are constituted by ideas; the whole world is nothing but idea and representation; and, since our mind is taken to be of a psychical nature, the result is that everything, absolutely everything, the person who knows and the thing known, are all psychical. This is panpsychism. Flournoy, on this point, says, with a charm coloured by irony: "We henceforth experience a sweet family feeling, we find ourselves, so to speak, *at home* in the midst of this universe . . ."[1] We have demonstrated above that the unity here attained is purely verbal, since we cannot succeed in suppressing the essential differences of things.

4. Now comes an affirmation on the genesis of things. After having admitted that the object is an idea of the mind, one of its manifestations, or one of its moods, the idealists go so far as to say that the consciousness is the generating power of ideas, and, consequently, the generating cause of the universe. It is thought which creates the world. That is the final conclusion.

I indicated, beforehand, in the chapters on the definition of sensation and on the distinction between the consciousness and the object, the reasons which lead me to reject the premises of idealism. It will be sufficient to offer here a

[1] *Archives de Psychologie*, vol. iv. No. 14, Nov. 1904, p. 132 (article on Panpsychism).

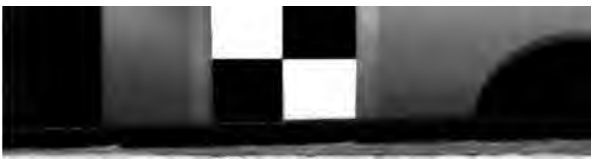
criticism on its last conclusion: "It is the mind that creates the world."

This thesis strikes at the duality—consciousness and object; it gives the supremacy to the consciousness by making of the object an effect or property of the former. We can object that this genesis cannot be clearly represented, and that for the very simple reason that it is impossible to clearly accept "mind" as a separate entity and distinct from matter. It is easy to affirm this separation, thanks to the psittacism of the words, which are here used like counterfeit coin, but we cannot represent it to ourselves, for it corresponds to nothing. The consciousness constitutes all that is mental in the world; nothing else can be described as mental. Now this consciousness only exists as an act; it is, in other terms, an incomplete form of existence, which does not exist apart from its object, of which the true name is matter. It is therefore very difficult to understand this affirmation, "It is the mind that creates the world," since to be able to do so, we should have to imagine a consciousness without an object.

Moreover, should we even succeed in doing so, we should be none the more disposed, on that account, to give assent to this proposition. Consciousness and matter represent to us the most different and antithetical terms of the whole of the

knowable. Were the hypothesis to be advanced that one of these elements is capable of engendering the other, we should immediately have to ask ourselves why this generating power and this pre-eminence should be attributed to one rather than to the other element. Who can claim that one solution is more clear, more reasonable, or more probable than the other?

One of the great advantages of the history of philosophy here asserts itself. This history shows us that different minds when reflecting on the same problems have come to conceive solutions which have appeared to them clear, and consequently were possible; now, as these solutions are often contradictory, nothing shows better than their collation the distance between possibility and fact. Thus the materialists, who, like the idealists, have put forward a genetic theory of the mind, have conceived mind as produced by matter;—a conception diametrically opposed to that of the idealists. It may be said that these two conceptions, opposed in sense, annul each other, and that each of these two philosophical systems has rendered us service by demonstrating the error of the opposing system.



CHAPTER III

MATERIALISM AND PARALLELISM

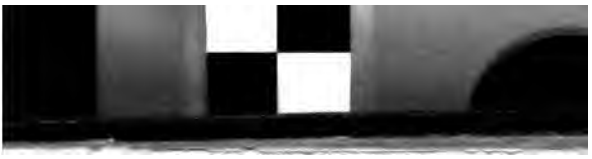
Materialism

Materialism is a very ancient doctrine. It is even the most ancient of all, which simply proves that amongst the different explanations given of our double physico-mental nature, this doctrine is the easiest to understand. The origin of materialism is to be found in the beliefs of savage tribes, and is again found, very clearly defined, in the philosophy of those ancient Greeks who philosophized before Plato and Aristotle. A still stranger fact is that the thoughts of a great number of the Fathers of the Church inclined towards the philosophy of matter. Then, in the course of its evolution, there occurred a moment of eclipse, and materialism ceased to attract attention till the contemporary period in which we assist at its re-birth. Nowadays, it constitutes a powerful doctrine, the more so that it has surreptitiously crept into the thoughts of many learned men without their being clearly conscious of it. There are many physicists and physiologists who think

and speak as materialists, though they have made up their minds to remain on the battle-ground of observed facts and have a holy horror of metaphysics. In a certain sense, it may be said that materialism is the metaphysics of those who refuse to be metaphysicians.

It is very evident that in the course of its long history, materialism has often changed its skin. Like all knowledge, it has been subject to the law of progress; and, certainly, it would not have been of a nature to satisfy the intellectual wants of contemporary scholars, had it not stripped itself of the rude form under which it first manifested itself in the mind of primitive man. Yet what has enabled the doctrine to keep its unity through all its changes is that it manifests a deeply human tendency to cling by preference to everything visible and tangible.

Whatever strikes the eyes, or can be felt by the hand, seems to us in the highest degree endowed with reality or existence. It is only much later, after an effort of refined thought, that we come to recognise an existence in everything that can be perceived in any way whatever, even in an idea. It is still later that we understand that existence is not only that which is perceived but also that which is linked logically with the rest of our knowledge. A good deal of progress has been necessary to reach this point.



As I have not the slightest intention of giving even an abridged history of materialism, let us come at once to the present day, and endeavour to say in what consists the scientific form this doctrine has assumed. Its fundamental basis has not changed. It still rests on our tendency to give chief importance to what can be seen and touched; and it is an effect of the hegemony of three of our senses, the visual, the tactile, and the muscular.

The extraordinary development of the physical sciences has no doubt given an enormous encouragement to materialism, and it may be said that in the philosophy of nature it occupies a principal place, and that it is there in its own domain and unassailable.

It has become the expression of the idea that everything that can be explained scientifically, everything susceptible of being measured, is a material phenomenon. It is the representation of the material explanation pushed to its last limits, and all experiments, all calculations, all inductions resting on the grand principle of the conservation of matter and energy plead in its favour.

We will examine with some precision how far such a doctrine solves the problem of the existence of the intellectual functions.

The doctrine has understood this connection as

being purely material, and has sought its image in other phenomena which are entirely so. Thus, it has borrowed from physiology the principle of its explanation, it has transported into the domain of thought the idea of function, and it has supposed that the soul is to the body in the relation of function to organ. Intelligence would thus be a cerebral function. To explain intelligence, materialists link it with matter, turn it into a property of matter, and compare it to a movement of matter, and sometimes even to a secretion. So Karl Vogt, the illustrious Genevan naturalist, one day declared, to the great scandal of every one, that the brain secretes the thought as the kidney does urine. This bold comparison seemed shocking, puerile, and false, for a secretion is a material thing while thought is not. Karl Vogt also employed another comparison: the brain produces the thought as the muscle produces movement, and it at once seems less offensive to compare the thought to a movement than to compare it to a liquid secretion. At the present day, an illustration still more vague would be used, such as that of a transformation of energy: chemical energy disengaged by the nerve centres would be thus looked upon as transformed into psychical energy.

However, it matters little what metaphors are applied to for help in explaining the passage from

the physical to the mental. What characterises materialist philosophy is its belief in the possibility of such a passage, and its considering it as the genesis of thought. "One calls materialist," says Renouvier, with great exactness, "every philosophy which defines thought as the product of a compound whose elements do not imply thought." A sweeping formula which allows us to foresee all the future avatars of the materialist doctrine, and to class them beforehand in the same category.

The criticisms which have been directed against materialism are all, or nearly all, variations of the principle of heterogeneity. We will not dwell long on this, but simply recollect that, according to this principle, it is impossible to attribute to the brain the capacity of generating consciousness. Physical force can indeed generate physical force under the same or a different form, and it thus produces all the effects which are determined by the laws of nature. But it is impossible to comprehend how physical force can enrich itself at a given moment by a conscious force. Physical force is reduced to movements of bodies and to displacements of atoms; how could a change of position in any inert objects give rise to a judgment, a reasoning, or any phenomenon of the consciousness? It is further said: this idea of function, which materialists

here introduce to render more comprehensible the passage from a material body to a spiritual action, contains only an empty explanation, for the function is not essentially distinct by its nature from the organ; it is simply "the organ in activity," it adds to the organ taken in a state of repose but one change, viz. activity, that is to say movement, and, consequently, the function of an organ is material by the same right as the organ. When a muscle contracts, this contraction, which is the proper function of the muscular fibre, consists in a condensation of the muscular protoplasm, and this condensation is a material fact. When a gland enters into activity, a certain quantity of liquid flows into the channels of the gland, and this liquid is caused by a physical and chemical modification of the cellular protoplasm; it is a melting, or a liquefaction, which likewise is material. The function of the nerve cell is to produce movement, or to preserve it, or to direct it; it is material like the cells. There is therefore nothing in all these functional phenomena which might lead us to understand how a material cause should be capable of engendering a conscious effect.

It seems that all materialists have acknowledged that here is the vulnerable point in their theory, for it is the principle of heterogeneity which they have especially combated. But their defence is

wanting in frankness, and principally consists in subterfuges.

In brief, it affirms that we are surrounded with mystery, that we are not sufficiently learned to have the right to impose limits to the power of matter, and to say to it: "Thou shalt not produce this phenomenon." A materialist theologian declares that he sees no impossibility in stones thinking and arguing, if God, in His infinite power, has decided to unite thought with brute matter. This argument is not really serious; it demands the intervention of so powerful a *Deus ex machina*, that it can be applied equally to all problems; to solve all is to solve none.

Modern materialists rightly do not bring God into the question. Their mode of argument takes another form; but it remains to be seen if, at bottom, it is not the same as the other. It simply consists in affirming that up till now we know certain properties of matter only, but that science every day discovers new ones; that matter is a reservoir of unknown forces, and that it is not impossible that the origin of psychical forces may yet be discovered in matter. This idea is clearly hinted at by Littré. The physicist Tyndall gave it a definite formula when he uttered at the Belfast Congress this phrase so often quoted: "If I look back on the limits of experimental science, I can discern in the bosom of that matter (which,

in our ignorance, while at the same time professing our respect for its Creator, we have, till now, treated with opprobrium) the promise and the power of all forms and qualities of life."

The opponents of the doctrine have not ceased to answer that the matter of to-morrow, like the matter of to-day, can generate none but material effects, and that a difficulty is not solved by putting off its solution to some indefinite date in our scientific evolution: and it certainly seems that the counter-stroke is decisive, if we admit the principle of heterogeneity with its natural consequence.

We will now criticise the above doctrine by making use of the ideas I have above enunciated. The criticism we have to apply to materialism is not the same as that just summarised. The axis of the discussion changes its position.

In the first place, I reproach materialism with presenting itself as a theory of the generation of the consciousness by the object. We have already reproached idealism with putting itself forward as a theory of the generation of the object by the consciousness. The error of the two systems is produced in a converse direction, but is of the same gravity. The consciousness and its object, we say yet again, constitute the widest division it is possible to effect in the domain of cognition; it is quite as illegitimate to reduce the first term to the second

as to reduce the second to the first. To reduce one to the other, by way of affiliation or otherwise, there must first be discovered, then, an identity of nature which does not exist.

In the second place, when one examines closely the explanation materialism has imagined in order to derive thought from an action of matter, it is seen that this representation is rendered completely impossible by all we know of the nature of thought. For the materialist to suppose for one moment that thought is a cerebral function, he must evidently make an illusion for himself as to what thought is, and must juggle with concepts. Perhaps, could we penetrate into his own inmost thought, we should discover that at the moment he supposes a mere cell can manufacture the phenomena of consciousness, some vague image suggests itself to him whereby he identifies these phenomena with a light and subtle principle escaping from the nerve cell, something which resembles an electric *effluve*, or a will-of-the-wisp, or the flame from a punch-bowl.[1]

I cannot, of course, tell whether my supposition is correct. But what I assert, with the calmness

[1] I can quote two observations in support of this. M. BRIEUX, to whom I was relating this part of my argument, stopped me, saying, "You have guessed right; I represent to myself thought issuing from brain in the form of an electric gleam." Dr. SIMON also informed me, during the reading of my manuscript, that he saw "thought floating over the brain like an *ignis fatuus*."

of perfect certitude, is that the materialist has not taken the pains to analyse attentively what he calls the phenomenon of consciousness. Had he made this analysis and kept the elements in his mind, he would have seen that it is almost impossible to hook in any way a phenomenon of consciousness on to a material molecule.

In fact, also, to take this into account, we will not remain within the vagueness of the concept, but will take a particular example to argue upon, viz. that of an external perception. I open my window on a fine day, and I see before me a sunny plain, with, as far as the eye can reach, houses amongst the trees, and again more houses, the most distant of which are outlined against my far-off horizon. This is my mental phenomenon. And while I am at my window, my eyes fixed on the view, the anatomist declares that, starting from my retina, molecular vibrations travel along the optic nerve, cross each other at the chiasma, enter into the fascia, pass through the internal capsule and reach the hemispheres, or rather the occipital regions, of the brain, where, for the moment, we agree to localise the centre of projection of the visual sensations. This is my physical phenomenon. It now becomes the question of passing from this physical phenomena to the mental one. And here we are stopped by a really formidable difficulty.

My mental phenomenon is not entirely mental, as is usually supposed from the deceitful brevity of the phrase. It is in great part physical, for it can be decomposed into two elements, a consciousness and its object; and this object of the consciousness, this group of little houses I see in the plain, belongs to sensation—that is to say, to something physical—or, in other words, to matter.

Let us examine in its turn the physical process which is supposed to be discovered in my nervous centres while I am in course of contemplating the landscape. This pretended physical process itself, quite as much as my conscious perception of the landscape, is a physico-psychical phenomenon; for my cerebral movements are perceived, hypothetically at least, by an observer. This is a perception, consequently it can be decomposed into two things, a consciousness and its object. As a further consequence, when we wish, by a metaphysical effort, to attach the consciousness to a material state of the brain and to establish a link between the two events, it will be found that we wrongly hook one physico-mental phenomenon on to another.

But, evidently, this objection is not a refutation. We may if we choose suppose that the so-called cerebral process is capable of subsisting at moments when no one perceives it, and that it exists of itself, is sufficient for itself, and is entirely

physical. But can we subject the mental process of perception to the same purification? Can we separate these two elements, the consciousness and its object, retain the element consciousness and reject the element object, which is physical, thus constituting a phenomenon entirely mental, which might then be possibly placed beside the entirely physical phenomenon, so as to study their relation to each other? This is quite impossible, and the impossibility is double, for it exists *de facto* and *de jure.*

De jure, because we have already established that a consciousness empty and without object cannot be conceived. *De facto,* because the existence of the object that consciousness carries with it is very embarrassing for the materialist; for this object is material, and as real and material as the fibres and cells of the brain. It might, indeed, be supposed that by transformation or otherwise there goes forth from the cerebral convolution a purely psychical phenomenon resembling a wave. But how can we conceive the transformation of this convolution into a semi-material phenomenon? How can we comprehend that there should issue from this convolution the material object of a perception—for example, a plain dotted with houses?

An English histologist remarked one day, with some eloquence, how little the most minute study

of the brain aided us to understand thought. He was thus answering Auguste Comte, who, in a moment of aberration, claimed that psychology, in order to become a science, ought to reject the testimony of the consciousness, and to use exclusively as its means of study the histology of the nerve centres and the measurement of the cranium. Our histologist, who had passed part of his life examining, under the microscope, fragments of cerebral matter, in following the forms of the cells, the course of the fibres, and the grouping and distribution of the fascia, made the following remark: "It is the fact that the study, however patient, minute, and thorough it might be, of this nerve-skein can never enable us to know what a state of consciousness is, if we do not know it otherwise; for never across the field of the microscope is there seen to pass a memory, an emotion, or an act of volition." And, he added, "he who confines himself to peering into these material structures remains as ignorant of the phenomena of the mind as the London cabman who, for ever travelling through the streets of the great city, is ignorant of what is said and what is going on in the interior of the houses." This picturesque comparison, the truth of which has never been questioned, is based on this supposition, that the psychical act is entirely immaterial and invisible, and therefore escapes the piercing eye of the

microscope. But a deeper analysis of the mind shows how little exact is this assertion. From the moment each psychical act implies a material object, we can ask ourselves two things: (1) Why is it that the anatomist does not discover these material objects in the interior of the brain? We ought to see them, for they are material, and therefore visible. We ought to see them with their aspect and colour, or be able to explain why they are not seen. In general, all that is described to us in the brain is the molecular vibrations. But we are not conscious of them. Where, then, is that of which we are conscious? (2) It should next be explained to us by what elaboration, transmutation, or metamorphosis a molecular disturbance, which is material, can transform itself into the objects which are equally material.

This is the criticism we have to address to materialism. Until proof to the contrary, I hold it to be irrefutable.

Parallelism

For this exposition to follow the logical order of ideas, the discussion on materialism should be immediately succeeded by that on parallelism. These two doctrines are near akin; they resemble each other as the second edition of a book, revised and corrected, resembles the first. Parallelism

is the materialist doctrine of those forewarned folk, who have perceived the errors committed and endeavour to avoid them, while cherishing all that can be saved of the condemned doctrine. That which philosophers criticised in materialism was the misunderstanding of the principle of heterogeneity. The parallelists have seen this mistake, and have taken steps to respect this principle: we shall see in what way. They are especially prudent, and they excel in avoiding being compromised. They put forth their hypothesis as a provisional one, and they vaunt its convenience. It is, say they, a practical method of avoiding many difficulties; it becomes for philosophers an equivalent of that phrase which so many timorous ministers repeat: "Above all, no scrapes!"

Let us study the exact point on which parallelism has amended materialism. We have seen that every materialist doctrine is the expression of this idea, that physical phenomena are the only ones that are determined, measurable, explicable, and scientific. This idea does wonders in the natural sciences, but is at fault when, from the physical, we pass into the moral world, and we have seen how the materialistic doctrine fails when it endeavours to attach the physical to the mental. There are then two great difficulties which the materialistic explanation finds

before it; one is a difficulty of mechanism and the other of genesis. By connecting the mind with the brain, like a function to its organ, this doctrine seeks to solve these two problems, and with what little success we have seen.

Parallelism has tried to avoid these two problems; not only does it not solve them, but it arranges so as not to propound them. The expedient adopted consists in avoiding the meeting of the physical and the mental; instead of placing them end to end and welding one to the other, they are placed in parallel fashion side by side. To explain their correlation, which so many observations vaguely demonstrate, the following hypothesis is advanced. Physical and psychical life form two parallel currents, which never mingle their waters; to every state of definite consciousness there corresponds the counterpart of an equally definite state of the nerve centres; the fact of consciousness has its antecedents and its consequences in the consciousness; and the physical fact equally takes its place in a chain of physical facts. The two series are thus evolved, and correspond strictly to each other according to a necessary law; so that the scholar who was perfectly instructed, and to whom one of these states was presented, could describe its fellow. But never does any of the terms of one series influence the terms of the other.

Observation and the testimony of the consciousness seem to attest this dual progress; but they are, according to the parallelist hypothesis, illusions. When I move my arm by a voluntary act, it is not my will, *qua* act of consciousness, which determines the movement of the arm—for this is a material fact. The movement is produced by the coming into play of groups of muscles. Each muscle, composed of a semi-fluid substance, being excited, contracts in the direction of its greatest length. The excitant of the muscles is also a material fact, a material influx which starts from the motor cells of the encephalon, and of which we know the course down through the pyramidal fascium, the anterior roots of the spinal cord, and the nerves of the periphery to its termination in the motor plates of the muscles. It is this excitement which is the physical, direct, and veritable cause of voluntary movements. And it is the same with all acts and signs, all expressions of our conscious states; the trembling of fear, the redness of anger, the movements of walking, down to the words we utter—all these are physical effects produced by physical processes, which act physically, and of which the mental counterpart has in itself no effective action.

Let it be understood that I am here pointing out one of the forms, and that the most usual, of the parallelist theory. Each author varies it

according to his fancy; some widen the correspondence between the physical and the moral, others prefer to narrow it. At one time a vague relation is supposed which is only true on a large scale, and is a union rather than an equivalence. At another, it is an exact counterpart, a complete duplicate in which the smallest physical event corresponds to a mental one.

In one of the forms of this theory that has been recently invented, parallelists have gone so far as to assert that there exists no real cohesion in the mental chain, and that no mental phenomenon can have the property of provoking another mental phenomenon by an act of true causality. It is within the nervous tissue, they say, that the nexus of psychic states should be enclosed. These should succeed in time without being directly connected with one another; they should succeed because the physical basis of them is excited in succession. Some of them would be like an air on the piano: the notes follow each other and arrange themselves into melodies, not by any affinity proper to themselves, but because the keys of the instrument are struck in the required order.

I said a little while ago that parallelism was a perfected materialism. The reason of this will be understood. It is a doctrine which preserves the determinism of physical facts while avoiding the compromising of itself in the difficult explanation

of the connection between the soul and the body. It remains scientific without raising a metaphysical heresy.

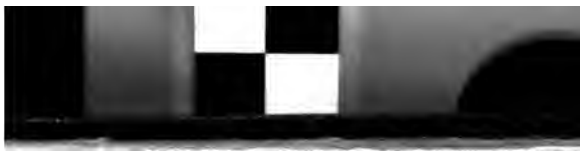
Bain is one of those who have most clearly expressed, not only the advantages, but also the aspirations of this theory (*Mind and Body*, p. 130):—

"We have every reason for believing," he says, "that there is in company with all our mental processes, *an unbroken material succession*. From the ingress of a sensation, to the outgoing responses in action, the mental succession is not for an instant dissevered from a physical succession. A new prospect bursts upon the view; there is mental result of sensation, emotion, thought—terminating in outward displays of speech or gesture. Parallel to this mental series is the physical series of facts, the successive agitation of the physical organs, called the eye, the retina, the optic nerve, optic centres, cerebral hemispheres, outgoing nerves, muscles, &c. While we go the round of the mental circle of sensation, emotion, and thought, there is an unbroken physical circle of effects. It would be incompatible with everything we know of the cerebral action, to suppose that the physical chain ends abruptly in a physical void, occupied by an immaterial substance; which immaterial substance, after working alone, imparts its results to the

other edge of the physical break, and determines the active response—two shores of the material with an intervening ocean of the immaterial. There is, in fact, no rupture of nervous continuity. The only tenable supposition is, that mental and physical proceed together, as undivided twins."

On reading this passage it is easy to see the idea which forms the basis of the doctrine. It is, as I have already said, the fetichism of mechanics: parallelism takes its inspiration from this quite as directly as does materialism, but with more skill, inasmuch as it avoids the most dangerous question, that of the interaction of physics and morals, and replaces it by an hypothesis much resembling Leibnitz's hypothesis of the pre-established harmony. On the other hand, a second merit of this prudent doctrine is the avoiding the question of genesis. It does not seek for the origin of thought, but places this last in a relation of parallelism with the manifestations of matter; and in the same way that parallel lines prolonged *ad infinitum* never meet, so the partisans of this doctrine announce their resolution not to inquire how the actual state of things has been formed, nor how it will end if, for example, one of the terms should disappear by the death of the bodily organism.

Notwithstanding so many precautions, criticisms have not been wanting; only they would seem not



to have touched the weak part of the doctrine and not to be decisive. We will only run through them briefly.

It has been said: there is no logical necessity which forces us to refuse to the consciousness the privilege of acting in complete independence of the nervous mechanism.

It has also been said: it is by no means certain that any nervous mechanism can be invented which imitates and, if need were, could replace an intellectual act. For instance, what association of nerve cells, what molecular action, can imitate an act of comparison which enables us to see a resemblance between two objects? Let it be supposed, for example, that the resemblance of two impressions come from a partial identity, and that the latter has for material support an identity in the seat or the form of the corresponding nervous influx. But what is identity? How can it be conceived without supposing resemblance, of which it is but a form? How, then, can the one be explained by the other? Thus, for instance, at the bottom of all our intellectual acts, there is a certain degree of belief. Can any material combination be found which corresponds thereto?

There is one last objection, the most serious of all. Parallelism, by establishing a fixed and invariable relation between the physical and the moral, ends by denying the rôle of this last, since the physical

mechanism is sufficient to draw to itself all the effects which general belief attributes to the moral. The parallelists on this point go very much further than the materialists; the latter at least concede that the consciousness is of some use, since they compared it to a function or a secretion, and, after all, a secretion is a useful liquid. The parallelists are so strongly convinced that mechanism is alone efficacious that they come to deny any rôle to thought. The consciousness for them has no purpose: yet it keeps company with its object. The metaphors which serve to define it, part of which have been imagined by Huxley, are all of a passive nature. Such is the light, or the whistling noise which accompanies the working of an engine, but does not act on its machinery. Or, the shadow which dogs the steps of the traveller. Or a phosphorescence lighting up the traces of the movements of the brain.

It has also been said that the consciousness is a useless luxury. Some have even gone further, and the fine and significant name of *epiphenomenon*, that has been given to thought, well translates that conception, according to which semi-realities may exist in nature.

All these objections certainly carry great weight, but they are not capable of killing the doctrine —they only scotch it.

I think there is a radical vice in parallelism, which till now has not been sufficiently indicated, and I ask what can really remain of the whole edifice when this vice has been once exposed?

Parallelism implies a false idea, which we have already come across when discussing materialism. It is the idea that a phenomenon of consciousness constitutes one complete whole.

The error proceeds from the use of concepts which cause the reality to be lost sight of. The reality shows that every phenomenon of consciousness consists in a mode of activity, an aggregate of faculties which require an object to fasten on to and so realise themselves, and that this object is furnished by matter. What we always note in intuition is the union, the incarnation of consciousness-matter. Our thoughts, our memories, our reasonings have as object sensations, images—that is to say, things which, strictly speaking, are as material as our own brains. It is therefore rather childish to put all these workings of the spirit on another plane and in another world than the workings of the brain since they are in great part of the same nature as the last named and they contain so many material elements. Now if we re-establish facts as they are, if we admit a parallelism between physical phenomena, on the one hand, and phenomena at once physical and psychical, on the other, the

parallelist hypothesis loses every sort of meaning. It ceases to present to us the image of two phenomena of an absolutely different order, which are found coupled together like the two faces of a unity, the front and back of a page, the right and wrong side of a stuff. If there is anything material in the psychical part, the opposition of nature no longer exists between the two terms; they become identical.

Very often, certain parallelists, after thinking they have discovered the duality of nature, endeavour to bring it back to unity by supposing that the two faces of the reality are as two effects of one unique reality, inaccessible to our senses and underlying appearances. Why go so far afield to seek unity? It is trouble in vain: for it is to be found in the phenomenon itself.

CHAPTER IV

MODERN THEORIES

It may be thought that the objection taken above to parallelism and materialism is personal to myself, because I have put it forward as the consequence of my analysis of the respective shares of thought and matter in every act of cognition. This is not so. I am here in harmony with other philosophers who arrived at the same conclusions long before me, and it may be useful to quote them.

We will begin with the prince of idealists, Berkeley. "'Everything you know or conceive other than spirits,' says Philonous to Hylas, 'is but your ideas; so then when you say that all ideas are occasioned by impressions made in the brain, either you conceive this brain or you do not. If you conceive it, you are in that case talking of ideas imprinted in an idea which is the cause of this very idea, which is absurd. If you do not conceive it, you are talking unintelligibly, you are not forming a reasonable hypothesis.' 'How can it be reasonable,' he goes on to say, 'to think that the brain, which is a sensible thing, *i.e.*

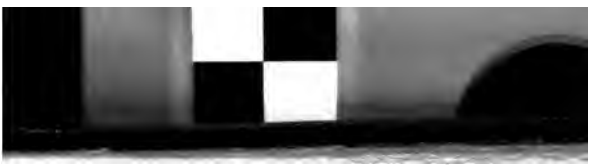
which can be apprehended by the senses—an idea consequently which only exists in the mind—is the cause of our other ideas?'"[1]

Thus, in the reasoning of Berkeley, the function of the brain cannot explain the production of ideas, because the brain itself is an idea, and an idea cannot be the cause of all our other ideas.

M. Bergson's argument is quite similar, although he takes a very different standpoint from that of idealism. He takes the word image in the vaguest conceivable sense. To explain the meaning of this word he simply says: "images which are perceived when I open my senses, and unperceived when I close them." He also remarks that the external objects are images, and that the brain and its molecular disturbances are likewise images. And he adds, "For this image which I call cerebral disturbance to generate the external images, it would have to contain them in one way or another, and the representation of the whole material universe would have to be implicated in that of this molecular movement. Now, it is enough to enunciate such a proposition to reveal its absurdity."[2]

[1] I borrow this quotation from RENOUVIER, *Le Personnellisme*, p. 263.

[2] *Matière et Mémoire*, p. 3. The author has returned to this point more at length in a communication to the Congrès de Philosophie de Génève, in 1904. See *Revue de Métaphysique et de Morale*, Nov. 1904, communication from H. BERGSON entitled "Le Paralogisme psycho-physiologique." Here is a passage



It will be seen that this reasoning is the same as Berkeley's, though the two authors are reasoning on objects that are different; according to Berkeley, the brain and the states of conscience are psychical states; according to Bergson, the definition of the nature of these two objects designated by the term image is more comprehensive, but the essential of his argument is independent of this definition. It is enough that the two terms should be of similar nature for one to be unable to generate the other.

My own argument in its turn comes rather near the preceding ones. For the idea of Berkeley, and the image of Bergson, I substitute the term matter. I say that the brain is matter, and that the perception of any object is perception of matter, and I think it is not easy to explain how from this brain can issue this perception, since that would be to admit that from one matter may come forth another matter. There is certainly here a great difficulty.

from this article which expresses the same idea: "To say that the image of the surrounding world issues from this image (from the cerebral movement), or that it expresses itself by this image, or that it arises as soon as this image is suggested, or that one gives it to one's self by giving one's self this image, would be to contradict one's self; since these two images, the outer world and the intra-cerebral movement, have been supposed to be of the same nature, and the second image is, by the hypothesis, an infinitesimal part of the field of representation, while the first fills the whole of it."

M. Bergson has thought to overcome it by attacking it in the following way. He has the very ingenious idea of changing the position of the representation in relation to the cerebral movement. The materialist places the representation after this movement and derives it from the movement; the parallelist places it by the side of the movement and in equivalence to it. M. Bergson places it before the movement, and supposes it to play with regard to it the part of exciting cause, or simply that of initiator. This cerebral movement becomes an effect of the representation and a motor effect. Consequently the nervous system passes into the state of motor organ; the sensory nerves are not, as supposed, true sensory nerves, but they are the commencements of motor nerves, the aim of which is to lead the motor excitements to the centres which play the part of commutators and direct the current, sometimes by one set of nerves, sometimes by others. The nervous system is like a tool held in the hand; it is a vehicle for action, we are told, and not a substratum for cognition. I cannot here say with what ingenuity, with what powerful logic, and with what close continuity of ideas M. Bergson develops his system, nor with what address he braves its difficulties.

His mind is remarkable alike for its power of systematisation and its suppleness of adaptation.

Before commencing to criticise him, I am anxious to say how much I admire him, how much I agree with him throughout the critical part of his work, and how much I owe to the perusal of his book, *Matière et Mémoire*. Though I was led into metaphysics by private needs, though some of the ideas I have set forth above were conceptions of my own (for example, the criticism of the mechanical theory of matter, and the definition of sensation), before I had read M. Bergson's book, it cannot be denied that its perusal has so strongly modified my ideas that a great part of these are due to him without my feeling capable of exactly discerning which; for ideas have a much more impersonal character than observations and experiments. It would therefore have been ungrateful to criticise him before having rendered him this tribute.

There are, in M. Bergson's theory, a few assertions which surprise us a little, like everything which runs counter to old habits. It has always been supposed that our body is the receptacle of our psychological phenomena. We store our reminiscences in our nerve centres; we put the state of our emotions in the perturbations of certain apparatus; we find the physical basis of our efforts of will and of attention in the sensations of muscular tension born in our limbs or trunk. Directly we believe that the nervous

system is no longer the depository of these states, we must change their domicile; and where are they to be placed? Here the theory becomes obscure and vague, and custom renders it difficult to understand the situation of the mind outside the body. M. Bergson places memory in planes of consciousness far removed from action, and perception he places in the very object we perceive.

If I look at my bookcase, my thought is in my books; if I look at the sky, my thought is in a star.[1] It is very difficult to criticise ideas such as these, because one is never certain that one understands them. I will therefore not linger over them, notwithstanding the mistrust which they inspire in me.

But what seems to me to require proof is the function M. Bergson is led to attribute to the sensory nerves. To his mind, it is not exact to say that the excitement of a sensory nerve excites sensation. This would be a wrong description, for, according to him, every nerve, even a sensory one, serves as a motor; it conducts the disturbance which, passing through the central commutator, flows finally into the muscles. But then, whence comes it that I think I feel a sensation when my sensory nerve is touched? Whence comes it that a pressure on the epitrochlear nerve gives me

[1] *Matière et Mémoire*, p. 31

a tingling in the hand? Whence comes it that a blow on the eyeball gives me a fleeting impression of light? One must read the page where M. Bergson struggles against what seems to me the evidence of the facts. "If, for one reason or another," he says, "the excitement no longer passes, it would be strange if the corresponding perception took place, since this perception would then put our body in relation with points of space which would no longer invite it to make a choice. Divide the optic nerve of any animal; the disturbance starting from the luminous point is no longer transmitted to the brain, and thence to the motor nerves. The thread which connected the external object to the motor mechanism of the animal by enveloping the optic nerve, is severed; the visual perception has therefore become powerless, and in this powerlessness consists unconsciousness." This argument is more clever than convincing. It is not convincing, because it consists in exaggerating beyond all reason a very real fact, that of the relation which can be discovered between our sensations and our movements. We believe, with M. Bergson, that it is absolutely correct to see in action the end and the *raison d'être* of our intelligence and our sensibility. But does it follow that every degree, every shade, every detail of sensation, even the most insignificant, has any importance for the action? The variations of

sensibility are much more numerous than those of movements and of adaptation; very probably, as is seen in an attentive study of infancy, sensibility precedes the power of motion in its differentiations. A child shows an extraordinary acuteness of perception at an age when its hand is still very clumsy. The correlation, then, is not absolute. And then even if it were so, it would not follow that the suppression of any movement would produce by rebound the suppression of the sensation to which this movement habitually corresponds. On this hypothesis, a sensation which loses its motor effect becomes useless. Be it so; but this does not prove that the uselessness of a sensation is synonymous with insensibility. I can very well imagine the movement being suppressed and the useless sensation continuing to evoke images and to be perceived. Does not this occur daily? There are patients who, after an attack of paralysis remain paralysed in one limb, which loses the voluntary movement, but does not necessarily lose its sensibility. Many clear cases are observed in which this dissociation takes place.

I therefore own that I cannot follow M. Bergson in his deduction. As a physiologist, I am obliged to believe firmly in the existence of the sensory nerves, and therefore I continue to suppose that our conscious sensations are consequent to the

excitement of these nerves and subordinate to their integrity. Now, as therein lies, unless I mistake, the essential postulate, the heart of M. Bergson's theory, by not admitting it I must regretfully reject the whole.

CHAPTER V

CONCLUSION

A FEW convinced materialists and parallelists, to whom I have read the above criticisms on their systems, have found no answer to them; my criticisms have appeared to them just, but nevertheless they have continued to abide by their own systems, probably because they were bound to have one. We do not destroy an erroneous idea when we do not replace it by another.

This has decided me to set forth some personal views which, provisionally, and for want of better, might be substituted for the old doctrines. Before doing this, I hasten to explain their character, and to state openly that they are only hypotheses.

I know that metaphysicians rarely make avowals of this kind. They present their systems as a well-connected whole, and they set forth its different parts, even the boldest of them, in the same dogmatic tone, and without warning that we ought to attach very unequal degrees of confidence to these various parts. This is a deplorable method, and to it is perhaps due the kind of disdain that observers and experimentalists feel for

metaphysics—a disdain often without justification, for all is not false, and everything is not hypothetical, in metaphysics. There are in it demonstrations, analyses, and criticisms, especially the last, which appear to me as exact and as certain as an observation or experiment. The mistake lies in mixing up together in a statement, without distinction, the certain with the probable, and the probable with the possible.

Metaphysicians are not wholly responsible for this fault of method; and I am much inclined to think that it is the natural consequence of the abuse of speculation. It is especially by the cultivation of the sciences of observation that we foster in ourselves the precious sense of proof, because we can check it any minute by experimental verification. When we are working at a distance from the facts, this sense of proof gets thinner, and there is lost that feeling of responsibility and fear of seeing one's assertions contradicted by a decisive countervailing observation, which is felt by every observer. One acquires the unbearable pride which I note in Kant, and one abandons one's self to the spirit of construction. I am speaking from personal experience. I have several times detected within me this bad spirit of construction. I have been seeking to group several facts of observation under the same idea, and then I have discovered that I was belittling

and depreciating those facts which did not fit in with the idea.

The hypothesis I now present on the relations of the mind and the brain has, for me, the advantage of bringing to light the precise conditions which a solution of this great problem must satisfy for this solution to be worthy of discussion.

These conditions are very numerous. I shall not indicate them all successively; but here are two which are particularly important.

1. The manifestations of the consciousness are conditioned by the brain. Let us suspend, by any means, the activity of the encephalic mass, by arresting the circulation of the blood for example, and the psychic function is at once inhibited. Compress the carotid, and you obtain the clouding-over of the intellect. Or, instead of a total abolition, you can have one in detail; sever a sensory nerve with the bistoury, and all the sensations which that nerve transmits to the brain are suppressed. Consciousness appears only when the molecular disturbance reaches the nerve centres; everything takes place in the same way as if this disturbance released the consciousness. Consciousness also accompanies or follows certain material states of the nerve centres, such as the waves which traverse the sensory nerves, which exercise reflex action in the cells, and which propagate themselves in the motor nerves. It is to the production, the dis-

tribution, and the integrity of this nervous influx that the consciousness is closely linked. It there finds one of the conditions of its apparition.

2. On the other hand, the consciousness remains in complete ignorance of these intra-cerebral phenomena. It does not perceive the nerve-wave which sets it in motion, it knows nothing of its peculiarities, of its trajectory, or the length of its course. In this sense it may be said that it is in no degree an anatomist; it has no idea of all the peculiarities of the nerve-wave which form part of its cerebral history from the moment when these peculiarities are out of relation with the properties of external objects.

One sometimes wonders that our consciousness is not aware that the objects we perceive with our two eyes correspond to a double undulation, namely, that of the right and that of the left, and that the image is reversed on the retina, so that it is the rods of the right which are impressed by objects on our left, and the rods of the upper part by objects below our eyes. These are, it has been very justly said, factitious problems, imaginary difficulties which do not exist. There is no need to explain, for instance, direct vision by a reversed image, because our consciousness is not aware that the image on the retina is reversed. In order to take account of this, we should require another eye to see this image.

This answer appears particularly to the point. It will be found that it is absolutely correct if we reflect that this case of the unfelt inversion of the image on the retina is but one example of the anatomical ignorance of the consciousness.

It might also be declared, in the same order of ideas, that our consciousness is ignorant, that excitements of the eye cross each other at the level of the chiasma, and pass through the internal capsule, and that the majority of the visual excitements of an eye are received by the opposite hemisphere.

A rather confused notion of these facts has formed itself in the minds of several critics, and I can discern the proof of this in the language they use. It will be said, for example, that the idea exists in the consciousness or in the mind, and phrases like the following will be avoided: "I think with my brain"—the suggestion consists in introducing an idea in the brain—"The nerve cell perceives and reasons, &c." Ordinarily these forms of speech are criticised because they appear to have the defect of establishing a confusion between two irreducible elements, the physical and the mental. I think the error of language proceeds from another cause, since I do not admit this distinction between the physical and the mental. I think that the error consists in supposing vaguely that the consciousness com-

prehends intra-cerebral phenomena, whereas it ignores them.

Let me repeat that there is no such thing as intra-cerebral sensibility. The consciousness is absolutely insensitive with regard to the dispositions of the cerebral substance and its mode of work. It is not the nervous undulation which our consciousness perceives, but the exciting cause of this wave—that is, the external object. The consciousness does not feel that which is quite close to it, but is informed of that which passes much further off. Nothing that is produced inside the cranium interests it; it is solely occupied with objects of which the situation is extra-cranial. It does not penetrate into the brain, we might say, but spreads itself like a sheet over the periphery of the body, and thence springs into the midst of the external objects.

There is, therefore, I do not say a contradiction, but a very striking contrast between these two facts. The consciousness is conditioned, kept up, and nourished by the working of the cerebral substance, but knows nothing of what passes in the interior of that substance. This consciousness might itself be compared to a parasitical organism which plunges its tap roots into the nerve centres, and of which the organs of perception, borne on long stalks, emerge from the cranium and perceive everything outside

that cranium. But this is, of course, only a rough image.

Strictly, it is possible to explain this distribution of the conscience, singular as it is at first sight, by those reasons of practical utility which are so powerful in the history of evolution.

A living being has to know the world external to himself in order to adapt and preadapt himself to it, for it is in this outer world that he finds food, shelter, beings of his own species, and the means of work, and it is on this world of objects that he acts in every possible way by the contractions of his muscles. But with regard to intracephalic actions, they are outside the ordinary sphere of our actions. There is no daily need to know them, and we can understand that the consciousness has not found very pressing utilitarian motives for development in that direction. One must be an histologist or a surgeon to find an appreciable interest in studying the structure of the nerve cell or the topography of the cerebral centres.

We can therefore explain well enough, by the general laws of adaptation, the reason of the absence of what might be called "cerebral sensibility," but, here as elsewhere, the question of the "Why" is much easier to solve than that of the "How."

The question of the "How" consists in ex-

plaining that the consciousness, directly aroused by a nerve-wave, does not perceive this undulation, but in its stead the external object. Let us first note that between the external object and the nervous influx there is the relation of cause to effect. It is only the effect which reaches us, our nerve cells, and our consciousness. What must be explained is how a cognition (if such a word may be employed here) of the effect can excite the consciousness of the cause. It is clear that the effect does not resemble the cause, as quality: the orange I am looking at has no resemblance with the brain wave which at this moment is traversing my optic nerve; but this effect contains everything which was in the cause, or, more exactly, all that part of the cause of which we have perception. Since it is only by the intermediary of our nervous system that we perceive the object, all the properties capable of being perceived are communicated to our nervous system and inscribed in the nerve wave. The effect produced therefore is the measure of our perception of the cause. This is absolutely certain. All bodies possess an infinity of properties which escape our cognitions; because, as excitants of our organism, these properties are wanting in the intensity or the quality necessary to make it vibrate; they have not been tuned in unison with our nervous chords. And, inversely, all we perceive

of the mechanical, physical, and chemical properties of a body is contained in the vibration this body succeeds in propagating through our cerebral atmosphere. There is in this a phenomenon of transmission analogous to that which is produced when an air of music is sent along a wire; the whole concert heard at the other extremity of the wire has travelled in the form of delicate vibrations.

There must therefore exist, though unperceived by our senses, a sort of kinship between the qualities of the external objects and the vibrations of our nerves. This is sometimes forgotten. The theory of the specific energy of the nerves causes it to be overlooked. As we see that the quality of the sensation depends on the nerve that is excited, one is inclined to minimise the importance of the excitant. It is relegated to the position of a proximate cause with regard to the vibration of the nerve, as the striking of a key on the piano is the proximate cause of the vibration of a string, which always gives the same degree of sound whether struck by the forefinger or third finger, or by a pencil or any other body. It will be seen at once that this comparison is inexact. The specific property of our nerves does not prevent our knowing the form of the excitant, and our nerves are only comparable to piano strings if we grant to these the property of vibrating dif-

ferently according to the nature of the bodies which strike them.

How is it that the nerve wave, if it be the depository of the whole of the physical properties perceived in the object, resembles it so little? It is because—this is my hypothesis—these properties, if they are in the undulation, are not there alone. The undulation is the work of two collaborators: it expresses both the nature of the object which provokes it and that of the nervous apparatus which is its vehicle. It is like the furrow traced in the wax of the phonograph which expresses the collaboration of an aërial vibration with a stylus, a cylinder, and a clock-work movement. This engraved line resembles, in short, neither the phonographic apparatus nor the aërial vibration, although it results from the combination of the two.

Similarly, I suppose that if the nervous vibration resembles so little the excitant which gives it birth, it is because the factor nervous system adds its effect to the factor external object. Each of these factors represents a different property: the external object represents a cognition and the nervous system an excitement.

Let us imagine that we succeed in separating these two effects. It will be conceived, theoretically, that a separation of this kind will lay bare the hidden resemblances, giving to each collaborator

the part which belongs to it. The excitement, for instance, will be suppressed, and the cognition will be retained. Is it possible to make, or at least to imagine, such an analysis? Perhaps: for, of these two competing activities, one is variable, since it depends on the constantly changing nature of the objects which come into relation with us; the other, on the contrary, is a constant, since it expresses the contribution of our nerve substance, and, though this last is of very unstable composition, it necessarily varies much less than the series of excitants. We consequently see faintly that these two elements differ sufficiently in character for us to be able to suppose that they are separable by analysis.

But how could this analysis be made? Evidently not by chemical or physical means: we have no need here of reagents, prisms, centrifugal apparatus, permeable membranes, or anything of that kind. It will suffice to suppose that it is the consciousness itself that is the dialyser. It acts by virtue of its own laws—that is to say, by changes in intensity. Supposing that sensibility increases for the variable elements of the undulation, and becomes insensible for the constant elements. The effect will be the same as a material dissociation by chemical analysis: there will be an elimination of certain elements and the retention of others.

Now, all we know of the consciousness authorises us to entrust this rôle to it, for it is within the range of its habits. We know that change is the law of consciousness, that it is effaced when the excitements are uniform, and is renewed by their differences or their novelty. A continued or too often repeated excitement ceases in time to be perceived. It is to condense these facts into a formula that Bain speaks of the law of relativity of cognition, and, in spite of a few ambiguities on the part of Spencer and of Bain himself in the definition of this law,[1] the formula with the sense I have just indicated is worth preserving.

Let us see what becomes of it, when my hypothesis is adopted. It explains how certain excitements proceeding from the objects—that is to say, forming part of the variable element—cease to be perceived when they are repeated and tend to become constant. *A fortiori*, it seems to me, should the same law explain how the constant element *par excellence*, the one which never varies from the first hour, is never perceived. There is, in the concert of the sounds of nature, an accompaniment so monotonous that it is no longer per-

[1] The *équivoque* perpetrated by BAIN and SPENCER consists in supposing that the consciousness bears solely on differences. This is going too far. I confine myself to admitting that, if sensation is not changed from time to time, the consciousness becomes weaker and disappears.

ceived, and the melody alone continues to be heard.

It is in this precisely that my hypothesis consists. We will suppose a nerve current starting from one of the organs of the senses, when it is excited by some object or other, and arriving at the centre of the brain. This current contains all the properties of the object, its colour, its form, its size, its thousand details of structure, its weight, its sonorous qualities, &c., &c., properties combined with and connected by the properties of the nerve-organ in which the current is propagated. The consciousness remains insensible to those nervous properties of the current which are so often repeated that they are annulled; it perceives, on the contrary, its variable and accidental properties which express the nature of the excitant. By this partial sensibility, the consciousness lays bare that which, in the nerve current, represents the object—that is to say, a cognition; and this operation is equivalent to a transformation of the current into a perception, image, or idea. There is not, strictly speaking, a transformation, but an analysis; only, the practical result is the same as that of a transformation, and is obtained without its being necessary to suppose the transmutation of a physical into a mental phenomenon.

Let us place ourselves now at the moment when

the analysis I am supposing to be possible has just been effected. Our consciousness then assists at the unrolling of representations which correspond to the outer world. These representations are not, or do not appear to be, lodged in the brain; and it is not necessary to suppose a special operation which, taking them in the brain, should project them to the periphery of our nerves. This transport would be useless, since for the consciousness the brain does not exist: the brain, with its fibres and cells, is not felt; it therefore supplies no *datum* to enable us to judge whether the representation is external or internal with regard to it. In other words, the representation is only localised in relation to itself; there is no determinate position other than that of one representation in relation to another. We may therefore reject as inexact the pretended law of eccentricity of the physiologists, who suppose that sensation is first perceived as it were centrally, and then, by an added act, is localised at the peripheric extremity of the nerve. This argument would only be correct if we admitted that the brain is perceived by the consciousness of the brain. I have already said that the consciousness is not an anatomist, and that therefore this problem does not present itself.

Such as it is, this hypothesis appears to me to present the advantage of explaining the reason

why our consciousness coincides, in certain circumstances, with the actions of the brain, and, in others, does not come near them. In other words, it contains an explanation of the unconscious. I can show this by quoting certain exact facts, of which the explanation has been hitherto thought to present difficulties, but which become very easy to understand on the present hypothesis. The first of these facts relates to the psychology of the motor current. This current has been a great feature in the studies which have been made on the feeling of effort and on the physical basis of the will. The motor current is that which, starting from the cerebral cells of the motor region, travels by way of the fibres of the pyramidal tract into the muscles of the body; and it is centrifugal in direction. Researches have been made as to whether we are or may be conscious of this current; or rather, the question has been put in somewhat different terms. It has been asked whether a psychological state can be the counterpart of this motor current, —if, for example, the feeling of mental effort produced in us at the moment of executing a difficult act or of taking a grave resolution, might not have this motor current for a basis.

The opinion which has prevailed is in the negative. We have recognised—a good deal on the faith of experiment, and a little also for theoretical

reasons—that no sensation is awakened by the centrifugal current. As to the sensation of effort, it has been agreed to place it elsewhere. We put it among the centripetal sensations which are produced as the movement outlines itself, and which proceed from the contracted muscles, the stretched ligaments, and the frictional movements of the articulations. Effort would therefore form part of all the psychical phenomenology, which is the duplicate of those sensory currents which are centripetal in direction.

In the long run, I can see no sort of theoretical reason for subordinating the consciousness to the direction of the nerve current, and for supposing that the consciousness is aroused when this current is centripetal, and that it cannot follow the centrifugal current. But this point matters little. My hypothesis would fairly well explain why the motor current remains unconscious; it explains the affair by taking into consideration the nature of this current and not its direction. This current is a motor one because it is born in the central cells, because it is a discharge from these cells, and is of entirely nervous origin. Since it does not correspond with the perception of an object—the ever varying object—it is always the same by nature. It does not carry with it in its monotonous course the *débris* of an object, as does

the sensory current. Thus it can flow without consciousness.

This same kind of hypothesis supplies us with the reasons why a given sensory current may be, according to circumstances, either conscious or unconscious. The consciousness resulting from the analysis of the molecular wave is, as it were, a supplementary work which may be subsequently added to the realised wave. The propagation of the wave is the essential fact—there is always time to become conscious of it afterwards. It is thus that we happen, in moments of abstraction, to remain insensible to certain even very powerful excitements. Our nervous system registers them, nevertheless, and we can find them again, later on, within the memory. This is the effect of a belated analysis.

The converse phenomenon occurs much more frequently. We remark many actions and perceptions which occur the first time with consciousness, emotion, and effort. Then, when they are repeated, as coordination becomes stronger and easier, the reflex consciousness of the operation becomes feebler. This is the law of habit, which slowly carries us towards automatism. These observations have even been extended, and the endeavour made to apply them to the explanation of the origin of reflex actions and of instincts which have all started with consciousness. This

is a rather bold attempt, for it meets with many serious difficulties in execution; but the idea seems fairly correct, and is acceptable if we may limit it. It is certain that the consciousness accompanies the effort towards the untried, and perishes as soon as it is realised. Whence comes this singular dilemma propounded to it by nature: to create something new or perish? It really seems that my hypothesis explains this. Every new act is produced by nerve currents, which contain many of those variable elements which the consciousness perceives; but, in proportion as the action of the brain repeats itself and becomes more precise and more exact, this variable element becomes attenuated, falls to its lowest pitch, and may even disappear in the fixation of habit and instinct.

My hypothesis much resembles the system of parallelism. It perfects it, as it seems to me, as much as the latter has perfected materialism. We indeed admit a kind of parallelism between the consciousness and the object of cognition; but these two series are not independent, not simply placed in juxtaposition as is possible in ordinary parallelism; they are united and fused together so as to complete each other. This new theory appears to me to represent a better form of the series of attempts which have been inspired by the common necessity of making the phenomena of

consciousness accord with the determinism of physical facts.

I hold fast to this physical determinism, and accept a strictly mechanical conception of the functions of the nervous system. In my idea, the currents which pass through the cerebral mass follow each other without interruption, from the sensorial periphery to the motor periphery; it is they, and they alone, which excite the movements of the body by acting on the muscles. Parallelism recognises all these things, and I do likewise.

Let us now see the advantages of this new system. First, it contains no paralogism, no logical or psychological error, since it does not advance the supposition that the mental differs by its nature from the physical phenomenon. We have discussed above the consequences of this error. They are here avoided. In the second place, it is explanatory, at least in a certain measure, since the formula we employ allows us to understand, better than by the principle of a simple juxtaposition, why certain nerve currents flow in the light of consciousness, while others are plunged into the darkness of unconsciousness. This law of consciousness, which Bain called the law of relativity, becomes, when embodied with my theory of the relations of the physical to the moral, an explanation of the distribution of consciousness through the actions of the brain.

I ask myself whether the explanation I have devised ought to be literally preserved. Perhaps not. I have endeavoured less to present a ready-made solution than to indicate the direction in which we ought to look for one. The law of consciousness which I have used to explain the transformation of a nerve current into perception and images is only an empirical law produced by the generalisation of particular observations. Until now there has been, so far as I know, no attempt to ascertain whether this law of consciousness, notwithstanding the general nature which some authors incline to ascribe to it, might not explain itself by some more general facts, and might not fit, as a particular case, into a more comprehensive frame. To be brief, this is very possible. I have not troubled myself about it, and I have made a transcendental use of this empirical law; for I have impliedly supposed it to be a first principle, capable of accounting for the development of the consciousness, but itself incapable of explanation.

If other observers discover that that which to me has appeared inexplicable, may be explained by quite peculiar causes, it is clear that my theory must be abandoned or modified. New theories must then be sought for, which will probably consist in recognising different properties in the consciousness. A little thought will discover several, I have

no doubt. By way of suggestion, I will indicate one of these hypothetical possibilities: "The consciousness has the faculty of reading in the effect that which existed in the cause." It is not rash to believe that by working out this idea, a certain solution would be discovered. Moreover, the essential is, I repeat, less to find a solution than to take account of the point which requires one; and metaphysics seem to me especially useful when it shows us where the gap in our knowledge exists and what are the conditions required to fill this gap.

Above all, I adhere to this idea, which has been one of the guiding forces of this book: there exists at the bottom of all the phenomena of the intelligence, a duality. To form a true phenomenon, there must be at once a consciousness and an object. According to passing tendencies, either of temperament or of fashion, preponderance has been given sometimes to one of the terms of this couple, sometimes to the other. The idealist declares: "Thought creates the world." The materialist answers: "The matter of the brain creates thought." Between these two extreme opinions, the one as unjustifiable as the other in the excesses they commit, we take up an intermediate position. Looking at the balance, we see no argument capable of being placed in the scale of the consciousness which may not be

neutralised by an argument placed in the scale of the object; and if we had to give our final verdict we should say: "The consciousness and matter have equal rights," thus leaving to every one the power to place, in this conception of an equality of rights, the hopes of survival of which his heart has need.

CHAPTER VI

RECAPITULATION

I ASK permission to reproduce here a communication made by me in December 1904 to the Société Française de Philosophie. I there set forth briefly the ideas which I have just developed in this book. This succinct *exposé* may be useful as a recapitulation of the argument.

Description of Matter.—The physicists who are seeking for a conception of the inmost structure of matter in order to explain the very numerous phenomena they perceive, fancy they can connect them with other phenomena, less numerous, but of the same order. They thus consider matter in itself.

We psychologists add to matter something more, viz. the observer. We consider matter and define it by its relations to our modes of knowledge—that is to say, by bearing in mind that it is conditioned by our external perception. These are two different points of view.

In developing our own standpoint, we note that of the outer world we are acquainted with nothing

but our sensations: if we propound this limit, it is because many observations and experiments show that, between the external object and ourselves, there is but one intermediary, the nervous system, and that we only perceive the modifications which the external object, acting as an excitant, provokes in this system.

Let us provisionally apply to these modifications the term sensations, without settling the question of their physical or mental nature.

Other experiments, again, prove to us that our sensations are not necessarily similar to the objects which excite them; for the quality of each sensation depends on what is called the specific energy of the nerve excited. Thus, whether the optic nerve be appealed to by a ray of light, an electric current, or a mechanical shock, it always gives the same answer, and this answer is the sensation of light.

It follows that our nervous system itself is only known to us as regards its structure by the intermediary of sensations, and we are not otherwise more informed upon its nature than upon that of any other object whatever.

In the second place, a much more serious consequence is that all our sensations being equally false, so far as they are copies of the excitants which provoke them, one has no right to use any of these sensations to represent to ourselves

the inmost structure of matter. The theories to which many physicists still cling, which consist in explaining all the modalities of matter by different combinations of movement, start from false premises. Their error consists in explaining the whole body of our sensations by certain particular sensations of the eye, of the touch, and of the muscular sense, in which analysis discovers the elements and the source of the representation of motion. Now these particular sensations have no more objective value than those of the tongue, of the nose, and of the ear; in so far as they are related to the external excitant of which it is sought to penetrate the inmost nature, one of them is as radically false as the other.

It is true that a certain number of persons will think to escape from our conclusion, because they do not accept our starting point. There exist, in fact, several systems which propound that the outer world is known to us directly without the intermediary of a *tertium quid*, that is, of sensation. In the first place, the spiritists are convinced that disembodied souls can remain spectators of terrestrial life, and, consequently, can perceive it without the interposition of organs. On the other hand, some German authors have recently maintained, by rather curious reasoning, that the specific energy of our nervous system does not transform the excitants, and that our sensations are the

faithful copies of that which causes them. Finally, various philosophers, Reid, Hamilton, and, in our own days, the deep and subtle mind of M. Bergson, have proposed to admit that by direct comprehension we have cognisance of the objects without mystery and as they are. Let this be admitted. It will change nothing in our conclusions, and for the following reasons.

We have said that no kind of our sensations—neither the visual, the tactile, nor the muscular—permits us to represent to ourselves the inmost structure of matter, because all sensations, without exception, are false, as copies of material objects. We are now assured that we are mistaken, and that our sensations are all true—that is to say, are faithful copies of the objects. If all are true, it comes to the same thing as if all are false. If all are true, it is impossible to make any choice among them, to retain only the sensations of sight and touch, and to use them in the construction of a mechanical theory, to the exclusion of the others. For it is impossible for us to explain some by the others. If all are equally true, they all have the same right to represent the structure of matter, and, as they are irreconcilable, no theory can be formed from their synthesis.

Let us, consequently, conclude this: whatever hypothesis may be built up on the relations possibly existing between matter and our sensa-

tions, we are forbidden to make a theory of matter in the terms of our sensations.

That is what I think of matter, understood as the inmost structure of bodies—of unknowable and metaphysical matter. I shall not speak of it again; and henceforth when I use the word matter, it will be in quite a different acceptation —it will be empirical and physical matter, such as it appears to us in our sensations. It must therefore be understood that from this moment we change our ground. We leave the world of *noumena* and enter that of phenomena.

Definition of Mind.—Generally, to define the mind, we oppose the concept of mind to the concept of matter, with the result that we get extremely vague images in our thoughts. It is preferable to replace the concepts by facts, and to proceed to an inventory of all mental phenomena.

Now, in the course of this inventory, we perceive that we have continually to do with two orders of elements, which are united in reality, but which our thought may consider as isolated. One of these elements is represented by those states which we designate by the name of sensations, images, emotions, &c.; the other element is the consciousness of these sensations, the cognition of these images, the fact of experiencing these emotions. It is, in other words, a special activity

of which these states are the object and, as it were, the point of application—an activity which consists in perceiving, judging, comparing, understanding, and willing. To make our inventory orderly, let us deal with these two elements separately and begin with the first.

We will first examine sensation: let us put aside that which is the fact of feeling, and retain that which is felt. Thus defined and slightly condensed, what is sensation? Until now we have employed the word in the very vague sense of a *tertium quid* interposed between the object and ourselves. Now we have to be more precise, and to inquire whether sensation is a physical or a mental thing. I need not tell you that on this point every possible opinion has been held. My own opinion is that sensation should be considered as a physical phenomenon; sensation, be it understood, in the sense of impression felt, and not in that of capacity to feel.

Here are the arguments I invoke for the support of my thesis: in the first place, popular opinion, which identifies matter with what we see, and with what we touch—that is to say, with sensation. This popular opinion represents a primitive attitude, a family possession which we have the right to retain, so long as it is not proved to us to be false: next, this remark, that by its mode of apparition at once unexpected, the revealer of

new cognitions, and independent of our will, as well as by its content, sensation sums up for us all we understand by matter, physical state, outer world. Colour, form, extent, position in space, are known to us as sensations only. Sensation is not a means of knowing these properties of matter, it is these properties themselves.

What objections can be raised against my conclusion? One has evidently the right to apply the term psychological to the whole sensation, taken *en bloc*, and comprising in itself both impression and consciousness. The result of this terminology will be that, as we know nothing except sensations, the physical will remain unknowable, and the distinction between the physical and the mental will vanish. But it will eventually be re-established under other names by utilising the distinction I have made between objects of cognition and acts of cognition;—a distinction which is not verbal, and results from observation.

What is not permissible is to declare that sensation is a psychological phenomenon, and to oppose this phenomenon to physical reality, as if this latter could be known to us by any other method than sensation.

If the opinion I uphold be accepted, if we agree to see in sensation, understood in a certain way, a physical state, it will be easy to extend this interpretation to a whole series of different phenomena.

To the images, first, which proceed from sensations, since they are recurring sensations; to the emotions also, which, according to recent theories, result from the perception of the movements which are produced in the heart, the vessels, and the muscles; and finally, to effort, whether of will or of attention, which is constituted by the muscular sensations perceived, and consequently also results from corporeal states. The consequences must be clearly remarked. To admit that sensation is a physical state, is to admit, by that very fact, that the image, idea, emotion, and effort — all those manifestations generally ascribed to the mind alone—are also physical states.

What, then, is the mind? And what share remains to it in all these phenomena, from which it seems we are endeavouring to oust it? The mind is in that special activity which is engaged in sensation, image, idea, emotion, and effort. For a sensation to be produced, there must be, as I said a little time ago, two elements: the something felt—a tree, a house, an animal, a titillation, an odour, — and also the fact of feeling this something, the consciousness of it, the judgment passed on it, the reasoning applied to it—in other terms, the categories which comprehend it. From this point of view, the dualism contained in sensation is clearly expressed. Sensation as a thing

felt, that is, the physical part, or matter; sensation as the fact of feeling or of judging, that is, the mind.

Mark the language I use. We say that matter is the something felt; but we do not say for the sake of symmetry, that the mind is the something which feels. I have used a more cautious, and, I think, a more just formula, which places the mind in the fact of feeling. Let me repeat again, at the risk of appearing too subtle: the mind is the act of consciousness; it is not a subject which has consciousness. For a subject, let it be noted, a subject which feels, is an object of cognition—it forms part of the other group of elements, the group of sensations. In practice we represent by mind a fragment of our own biography, and by dint of pains we attribute to this fragment the faculty of having a consciousness; we make it the subject of the relation subject-object. But this fragment, being constituted of memories and sensations, does not exactly represent the mind, and does not correspond to our definition; it would rather represent the mind sensationalised or materialised.

From this follows the curious consequence that the mind is endowed with an incomplete existence; it is like form, which can only be realised by its application to matter of some kind. One may fancy a sensation continuing to exist, to live

and to provoke movements, even after ceasing to be perceived. Those who are not uncompromising idealists readily admit this independence of the objects with regard to our consciousness, but the converse is not true. It is impossible to understand a consciousness existing without an object, a perception without a sensation to be perceived, an attention without a point of application, an empty wish which should have nothing to wish for; in a word, a spiritual activity acting without matter on which to act, or more briefly still—mind without matter. Mind and matter are correlative terms; and, on this point, I firmly believe that Aristotle was much closer to the truth than many modern thinkers.

I have convinced myself that the definition of mind at which we have just arrived is, in its exactness and soberness, the only one which permits psychology to be distinguished from the sciences nearest to it. You know that it has been discovered in our days that there exists a great difficulty in effecting this delimitation. The definitions of psychology hitherto proposed nearly all have the defect of not agreeing with the one thing defined. Time fails us to review them all, but I shall point out one at least, because our discussion on this particular formula will serve as a preparation for taking in hand the last question that remains to

be examined—the relation of the mind to the body.

According to the definition I am aiming at, psychology would be the science of internal facts, while the other sciences deal with the external. Psychology, it has also been said, has as its instrument introspection, while the natural sciences work with the eye, the touch, the ear—that is to say, with the senses of extrospection.

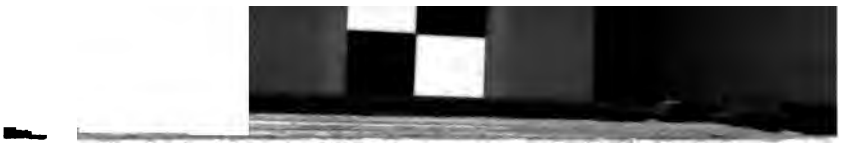
To this distinction, I reply that in all sciences there exist but two things: sensations and the consciousness which accompanies them. A sensation may belong to the inner or the outer world through accidental reasons, without any change in its nature; the sensation of the outer world is the social sensation which we share with our fellows. If the excitant which provokes it is included in our nervous system, it is the sensation which becomes individual, hidden to all except ourselves, and constituting a microcosm by the side of a macrocosm. What importance can this have, since all the difference depends on the position occupied by the excitant?

But we are persistently told: there are in reality two ways of arriving at the cognition of objects—from within and from without. These two ways are as opposite as the right and wrong side of a stuff. It is in this sense that psychology is the science of the within and looks at

the wrong side, while the natural sciences reckon, weigh, and measure the right side. And this is so true, they add, that the same phenomenon absolutely appears under two forms radically different from each other according as they are looked at from one or the other of the two points of view. Every one of our thoughts, they point out to us, is in correlation with a particular state of our cerebral matter; our thought is the subjective and mental face, the corresponding cerebral process is the objective and material face.

Though this dualism is frequently presented as an observed truth, I think it is possible to show its error. Take an example: I look at the plain before me, and see a flock of sheep pass through it. At the same time an observer, armed with a microscope *à la* Jules Verne, looks into my brain and observes there a certain molecular dance which accompanies my visual perception. Thus, on the one hand, is my representation; on the other, a dynamic state of the nerve cells. This is what constitutes the right and the wrong sides of the stuff. We are told, "See how little resemblance there is in this; a representation is a psychical, and a movement of molecules a material, thing."

But I, on the contrary, think there is a great resemblance. When I see the flock passing, I have a visual perception. The observer who, by the hypothesis, is at that moment looking into



my brain, also experiences a visual perception. Granted, they are not the same perception. How could they be the same? I am looking at the sheep, he is looking at the interior of my brain; it is not astonishing that, looking at objects so different, we should receive images also very different. But, notwithstanding their difference of object—that is, of content—there are here two visual perceptions composed in the same way: and I do not see by what right it can be said that one represents a material, the other a physical, phenomenon. In reality, each of these perceptions has a two-fold and psycho-physical value—physical in regard to the object to which it applies, and psychical inasmuch as it is an act of perception, that is to say, of consciousness. For one is just as much psychical as the other, and as much material, for a flock of sheep is as material a thing as is my brain. If we keep this conclusion in our minds, when we come to make a critical examination of certain philosophical systems, we shall easily see the mistake they make.

Spiritualism[1] rests on the conception that the mind can subsist and work in total independence of any tie to matter. It is true that, in details, spiritualists make some modification in this absolute principle in order to explain the perceptions of the senses and the execution of the orders of the

[1] See note on p. 191.

will; but the duality, the independence, and the autonomy of the soul and the body remain, in any case, the peculiar dogma of the system. This dogma appears to me utterly false; the mind cannot exist without matter to which it is applied; and to the principle of heterogeneity, so often invoked to forbid all commerce between the two substances, I reply by appealing to intuition, which shows us the consciousness and its different forms, comparison, judgment, and reasoning, so closely connected with sensation that they cannot be imagined as existing with an isolated life.

Materialism, we know, argues quite differently; it imagines that a particular state of the nerve centres has the virtue of generating a psychical phenomenon, which represents, according to various metaphors, property, function, effect, and even secretion. Critics have often asked how, with matter in motion, a phenomenon of thought could be explained or fabricated. It is very probable that those who admit this material genesis of thought, represent it to themselves under the form of something subtle, like an electric spark, a puff of wind, a will-of-the-wisp, or an alcoholic flame. Materialists are not alone responsible for these inadequate metaphors, which proceed from a metaphysics constructed of concepts. Let us recollect exactly what a psychical phe-

nomenon is. Let us banish the will-o'-the-wisps, replace them by a precise instance, and return to the visual perception we took as an example a little while back: without intending a pun, "revenons à nos moutons." These sheep which I see in the plain are as material, as real, as the cerebral movement which accompanies my perception. How, then, is it possible that this cerebral movement, a primary material fact, should engender this secondary material fact, this collection of complicated beings which form a flock?

Before going any further, let us invite another philosophical system to take a place within the circle of our discussion; for the same answer will suffice for it as well as for the preceding one, and it will be as well to deal with both at once. This new system, parallelism, in great favour at the present day, appears to me to be a materialism perfected especially in the direction of caution. To escape the mystery of the genesis of the mind from matter, this new system places them parallel to each other and side by side, we might almost say experimentally, so much do parallelists try to avoid talking metaphysics. But their position is untenable, and they likewise are the victims of the mirage of concepts; for they consider the mental as capable of being parallel to the physical without mingling with it, and of subsisting by itself and with a life of its own. Such a hypothesis is only

possible by reason of the insufficient definition given to the mind. If it be recognised that the mind has an incomplete existence and is only realised by its incarnation in matter, the figure which is the basis of parallelism becomes indefensible. There is no longer on the one hand the physical, and on the other the mental, but on one side the physical and the mental combined, and on the other the same combination; which amounts to saying that the two faces to a reality, which it was thought had been made out to be so distinct, are identical. There are not two faces, but one face; and the monism, which certain metaphysicians struggle to arrive at by a mysterious reconciliation of the phenomenal duality within the unity of the noumenon, need not be sought so far afield, since we already discover it in the phenomenon itself.

The criticisms I have just pointed out to you, only too briefly, are to be found in several philosophers, confusedly in Berkeley, and with more precision in M. Bergson's book on *Matière et Mémoire*. The latter author, remarking that our brain and the outer world are to us images of the same order, refuses to admit that the brain, which is only a very small part of these images, can explain and contain the other and much larger part, which comprises the vast universe. This would amount to saying that the whole is comprised in the part.

I believe that this objection is analogous to the one just stated with less ingenuity.

It is interesting to see how M. Bergson gets out of the difficulty which he himself raised. Being unwilling to bring forth from the molecular movement of the brain the representation of the world, or to superpose the representation on this movement as in the parallelist hypothesis, he has arrived at a theory, very ingenious but rather obscure, which consists in placing the image of the world outside the brain, this latter being reduced to a motor organ which executes the orders of the mind.

We thus have four philosophical theories, which, while trying to reconcile mind with matter, give to the representation a different position in regard to cerebral action. The spiritualist asserts the complete independence of the representation in relation to cerebral movement; the materialist places it after, the parallelist by the side of, the cerebral movement; M. Bergson puts it in front.

I must confess that the last of these systems, that of M. Bergson, presents many difficulties. As he does not localise the mind in the body, he is obliged to place our perception—that is to say, a part of ourselves—in the objects perceived; for example, in the stars when we are looking at them. The memory is lodged in distant planes of consciousness which are not otherwise defined. We

understand with difficulty these emigrations, these crumblings into morsels of our mind. This would not matter if our author did not go so far as to maintain that the sensory nerves of the brain are not sensory nerves, and that the severance of them does not suppress sensations, but simply the motor efforts of these sensations. All the physiologist in me protests against the rashness of these interpretations.

The principal difficulties of the problem of the union between the mind and the body proceed from the two following facts, which seem incompatible. On the one hand, our thought is conditioned by a certain intra-cerebral movement of molecules and atoms; and, on the other hand, this same thought has no consciousness of this molecular movement. It does not know the path of the wave in our nerves; it does not suspect, for example, that the image of the objects is reversed in the retina, or that the excitements of the right eye for the most part go into the left hemisphere. In a word, it is no anatomist. It is a very curious thing that our consciousness enters into relation only with the extra-cerebral, the external objects, and the superficies of our bodies.

From this, this exact question suggests itself: a molecular wave must come as far as our visual cerebral centre for us to have the perception of the object before our eyes; how is it that our con-

sciousness is unaware of this physiological event from which it depends, and is borne towards the distant object as if it sprang forth outside our nervous system?

Let us first remark, that if we do not perceive this wave, yet it must contain all we know of the external object, for it is evident that we only know of it that part of its properties which it transmits to our nerves and our nerve centres. All the known substance of the external object is, then, implied in this vibration; it is there, but it is not there by itself. The vibration is the work of two collaborators; it expresses at once the nature of the object which provokes it, and the nature of the nerve apparatus which transports it, as the furrow traced in the wax of the phonograph implies the joint action of an aërial vibration with a stylus, a cylinder, and a clock-work apparatus.

I therefore suppose—and this is, I say it plainly, but an hypothesis—that if the nervous vibration so little resembles the external excitant which generates it, it is because the factor nervous system superadds its effect to the factor excitant. Let us imagine, now, that we have managed to separate these two effects, and we shall understand that then the nervous event so analysed might resemble only the object, or only the nervous system. Now, of these two effects, one is constant, that one which represents the action of the nervous system;

there is another which varies with each new perception, and even with every moment of the same perception—that is to say, the object. It is not impossible to understand that the consciousness remains deaf to the constant and sensitive to the variable element. There is a law of consciousness which has often been described, and fresh applications of which are met with daily: this is, that the consciousness only maintains itself by change, whether this change results from the exterior by impressions received, or is produced from the interior by movements of the attention. Let us here apply this empirical law, and admit that it contains a first principle. It will then be possible for us to understand that the consciousness formed into a dialyser of the undulation may reject that constant element which expresses the contribution of the nervous system, and may lay bare the variable element which corresponds to the object: so that an intestinal movement of the cerebral substance, brought to light by this analytical consciousness, may become the perception of an object. By accepting this hypothesis, we restore to the sensory nerves and to the encephalic centres their property of being the substrata of representation, and avoid the objection made above against materialism and parallelism, that they did not explain how a cerebral movement, which is material, can engender the perception of an object which differs

greatly from it and is yet as material as the movement itself. There is not here, properly speaking, either generation, transformation, or metamorphosis. The object to be perceived is contained in the nerve current. It is, as it were, rolled up in it; and it must be made to go forth from the wave to be seen. This last is the work of the consciousness.

INDEX

ABSTRACTIONS, character of, 8
"Archives de Psychologie," 198
Aristotle, 106, 129, 169, 186–190, 201, 265
Association, "inseparable," 116
Automatism, 250

BAIN, 3, 121, 186, 189, 219, 245, 252
Belfast, congress at, 207
Bergson, 47, 86; theory of images and brain, 226–230; refutation of, 230–233; 259, 271, 272
Berkeley, 47, 109, 225, 226, 227, 271
Berthelot, 147
Binet, 3, 191; theory of mind and brain, 236, 255
Body, union with mind, 179; Aristotle on body and soul, 188
Brain, 225, 226, 227; and consciousness, 236, 237, 247
Brieux, 209
Brillouin, 10

CATEGORIES, 106, 107, 114, 190, 263
Change, law of consciousness, 245
Cognition, 15, 33, 58, 98, 105, 107, 117, 123, 140, 141, 145, 153, 155, 157, 162, 184, 190, 195, 208, 225, 228, 241, 243, 246, 251, 260, 262, 264, 266
Comte, Auguste, 213
Concepts, method of, 6, 7; metaphysics of, 8, 223
Conclusion, 234–255
Condillac, 98
Condition, normal, 80
Consciousness, 58, 195; anatomical ignorance of, 237, 238; definition of: relation subject-object, categories of the understanding, separability of the consciousness from its object, idealism, 96–134; as dialyser, 244; law of, 275, 276; and nerve current, 247–255; manifestations of, 236; of a state, 63; origin of, 180; phenomena of, 17, 88, 190, 210, 223; useless luxury, 222
Contiguity, law of, 169, 170, 173
Current, motor, psychology of, 248, 249; nerve, 246, 249, 250, 251, 252, 276; sensory, 250

DANTEC, "Les Lois Naturelles," 10
Dastre, "La Vie et la Mort," 10, 145
Democritus, 158
Descartes, 64, 77, 78, 97, 152, 193
"Discours de la Méthode," 77
Dreams, 82, 87
Dualism, of mind and matter, 69, 71, 182, 140, 155, 182, 254, 263
Duality, of sensation, 78; of ideation, 78; of consciousness and object, 199; of nature, 224; of soul and body, 269
Duhem, evolution of mechanics, 10

EBBINGHAUS, 160, 161
Eccentricity, law of, 247
Effort, psychological nature of, 94; sensation of, 249, 263
Ego, 75, 86, 88, 89, 99, 152; and non-ego, 96, 100, 101
Emotions, definitions of the, 88–95, 263
Energy, 30, 31
Enumeration, method of, 6
Epiphenomenon, 222
"Etude Experimentale de l'Intelligence" (Binet), 8
Excitant, the, 18, 21, 22, 83, 244, 257, 258, 266
Existence or reality, 84, 85
Externospection, 140–146

FATHERS of the Church, 201
Fechner, 149
Ferrier, 73
Finality, definition of, 163
Flournoy, 70, 73, 182, 191, 198

GENEVA, congress of, philosophy at, 226
Goblot, E., "La Finalité sans Intelligence," 164

HABIT, law of, 250
Hallucinations, 81, 82, 87
Hamilton, William, 47, 65, 256; "Philosophy" of, 47
Herbart, 90, 91
Herrick, C. L., 86
Heterogeneity, axiom of, 182, 183; principle of, 8, 73, 74, 182, 183, 194, 205, 206, 208, 215, 269
"Histoire du Matérialisme" (Lange), 137
Hume, 64, 109
Huxley, 118, 222

IDEALISM, principle of, 64, 73, 119–125; refutation of, 95–200
Ideation, duality of, 78, 80
Identity, 221
Image, definition of the, 76–87, 263
Intellectualism, definition of, 166
Intelligence, only inactive consciousness, 117; materialist explanation of, 204
Inter-actionism, 185
Introspection, 140–146
Intuition, 269

JAMES, William, theory of emotion, 91–94; 100, 163
"Journal of Philosophy," 100

KANT, 34, 106, 107, 108, 181, 190, 235
Kelvin, Lord, 11
Knowable, the, 4, 5, 7
Knowledge and its object, 55–59; two groups of, 98
Külpe, 160

"L'AME et le Corps," 3
"La Finalité sans Intelligence" (Goblot), 164
"La Nouvelle Monadologie" (Renouvier et Prat), 64
"La Philosophie de Hamilton," 47
"La Vie et la Mort" (Dastre), 10
Ladd, 58 *n.*
Lange, theory of emotion, 91; "Histoire du Matérialisme," 137
Law of contiguity, 162 *n.*, 169, 170, 173
Law of eccentricity, 247
Law of mental expression rejected, 162 *n.*; mental distinguished from physical, 163
Law, psychological compared with natural, 167, 168
Law of relativity of cognition, 245
Law of similarity, 162 *n.*, 169, 170
Le Bon, Gustave ("l'Evolution de la Matière"), 27
"Le Paralogisme psycho-physiologique" (Bergson), 226

"Le Personnellisme" (Renouvier), 226
"Leçons de Philosophie (Rabier), 148
Leibnitz, 129, 195, 220
Littré, 207
Locke, 139
"Logical and Psychological Distinction between the True and the Real" (Herrick), 86
Lotze, 73, 148
Lyons, 66

MACH, 160
Materialism, origin and definition of, 201–203; refutation of, 203–214; 269, 275
"Matière et Mémoire" (Bergson), 86, 226, 229, 230, 271
Matter, definition of, 3–51; description of, 256–260; distinct from mind, 3; domain of physics, 6; mechanical theories of, 27–43; non-significant properties of, 172, 173; *X* of, 18, 21, 25, 49
Mechanics, fetichism of, 220
Mechanism, nervous, to imitate intellectual act, 221
Metaphysics, 128 *n.*, 234, 235
"Métaphysique et Psychologie" (Flournoy), 182
Method, rule of, 5; of concepts and enumeration, 6
Meudon, 152
Mill, John Stuart, 13, 19, 47, 64, 116, 121
Mind, definition of, 55–175; 260–266; distinction between, and matter, 3; domain of psychology, 6; incomplete life of, 179–190; inseparability of, and matter, 185; inventory of, 56; "Mind and Body" (Bain), 3, 219
Monadism, 195
Monism, 69, 271
Motion, 35
Movement, molecular, 73; vibratory, 31
Müller, 21
Münsterberg, 160

NERVES, motor, 228, 230; power of distinction, 22; specific energy of, 21, 46, 242; sensory, 228, 230, 232, 273, 275; vibrations of, 242, 243; nervous system, 16, 17, 24, 25, 44, 45, 48, 115, 228, 241, 257, 258, 274, 275
Noumena, 34, 35, 43, 109, 142 *n.*, 260, 271

OBJECT. See *Subject*
Observation, 235
Organ, function of, material, 206
Ostwald, 10

PANMATERIALISM, 70
Panpsychism, 70, 195, 198
Parallelism, definition of, 214–220; refutation of, 221–224; 251; 252, 270–272; 275
Parallelist theory, 132
Perceptible, the, 84, 85
Perception, intermediate character of, 15; of a child, 232
Personality, formation of, 100
Phenomena, auditory, 37; physical, 30, 31; visual, 37
Phenomenism of Berkeley, 109 *n.* 1
"Philosophical Review," 70
Philosophy, history of, 200
"Philosophy of Hamilton" (J. S. Mill), 47
Pilon, 113
Plato, 201
Preadaptation, process of, 164–175
Prince, Morton, 70
Probabilism forced upon us, 174
"Psychical Review," 86
"Psychologie," 112
"Psychologie du Raisonnement" (Binet), 113

Psychology, definitions of, 135–175, 265, 266

RABIER, E., 98, 112, 148
Radio-activity, 27
Reason developed according to law, 169
Recapitulation, 256–276
Reid, Thomas, 47, 65, 259
Relativity, principle of, 104, 109, 252
Renouvier, 64, 97, 106, 205, 226
"Revue Générale des Sciences," 10
"Revue de Métaphysique et de Morale," 164, 226
"Revue de Philosophie," 10
Raymond, Du Bois, 73
Ribot, 137

SEARCH, direction of, 5, 6
Sensation, 10, 14, 35, 44, 50, 51, 55; definition of, 60–75; mistrusted by physicists, 28–30; only means of acquaintance with outer world, 10–26, 50, 256–259; physical or mental, 261–266; visual, 73
Sensibility, cerebral, 239, 240; employment in physiology, 61
Separation of consciousness from its object, 126–134
Similarity. See *Law*
Simon, Dr., 209
Société Française de Philosophie, 256
Soul, distinct from body, 77; union of body and, 179–276
Souls, disembodied, 45
Specificity of Nerves. See *Nerves*
Spencer, Herbert, 245
Spiritualism, refutation of, 192, 195, 268, 269
Strong, M., 195
Subject, defined and distinguished from object, 96
Substance, definition of, 102
Substantialism, 134
Symbols, mechanical theories of matter, 27–43
System, nervous, 16, 17, 24, 25, 44, 45, 48, 115, 228, 241, 257, 258, 274, 275

TAINE, 79
Theories, modern, 225–233
Thought, not a movement, 7, 8; characteristics of, 76
Truth, 84, 85
Tyndall, 89, 207

UNCONSCIOUSNESS, 127–133
Understanding, categories of the, 103–118
Unknowable, the, 25, 26
Union of mind and body, problem of, 273; of soul and body, 179–276

VERNE, Jules, 267
Vogt, Karl, 204

WAVE, molecular, 273, 274, 276; nerve, 243
Will, the most characteristic psychical function, 166, 167
World, assembly of sensations, 26; our ideas, 65; external known only by our sensations, 10–26; 50, 256–259

X of matter, 18, 21, 25, 49

ZOOLOGIST, visual sensations of, 13

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